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ABSTRACT

This report provides the groundwork for the development of a master plan for vocational education in the Los Angeles City Junior College District. Following a review of the problems associated with current occupational programs, a series of recommendations is presented along with directives for their implementation. Topics discussed included curriculum, vocational guidance and placement services, evaluation, continuing education for professional staffs, and budgeting. Personnel needs include planning and placement committees, a placement coordinator, instructional designers, guidance personnel, professional staffs for continuing education, and an evaluation unit. The functions, procedures, and resources, as well as a model, for each of these system components were provided. Data gathered from the district colleges and presented in tabular form included: (1) trends from 1962 regarding placement service data, advisory committee meetings, and employment market data by industry; (2) curriculum predictions for the next five years; (3) needs and student suggestions for instructional programs; (4) programs for disadvantaged and handicapped students; and (5) funding of Vocational Education Act projects, 1968-69. [Not available in hard copy due to marginal legibility of original document.] (MB)

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occupational education 1970-75

Foundation for a Master Plan

Prepared for the Los Angeles Community Colleges

February–June 1969

by Isabel H. Beck, Ph.D.

JC 690 364

Los Angeles, California
August 1969

UNIVERSITY OF CALIF.
LOS ANGELES

NOV 05 1969

CLEARINGHOUSE FOR
JUNIOR COLLEGE
INFORMATION

FORWARD

This report is a first step in the development of a Master Plan for Vocational Education for the Los Angeles City Junior College District. The California State Department of Education allocated funds for this study and others in Long Beach, Oakland, San Diego, and San Francisco, as part of a Master Plan for Vocational Educational for the public schools of the State.

The College Committee of the Los Angeles City Board of Education recommended preparation of this report as a part of a survey which includes Secondary and Adult Education, with cognizance of the fact that the completion date coincided with the last day the Board had jurisdiction over the Colleges. The Board agreed to authorize the College report for information only, leaving full option for consideration of a Master Plan to the Board of the new Junior College District after July 1, 1969.

This report opens questions of appropriate procedures, present status, and changing needs as related to development and evaluation of occupational education in the Los Angeles Community Colleges. It is a collection of information and ideas, the groundwork for considered construction of a plan by College staffs to which they will commit themselves. In the academic tradition, a specific plan is designed by the people who will implement it. That will be the next step.

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1. prologue: on the campus...

For quite a while most students have shown disenchantment with junior college occupational education. Most have chosen transfer curricula, often an expression of the feeling that occupational education prepares one for second class status in American life; minority people particularly are sensitive to this. Also, students do not believe advisors who predict difficulty in a transfer program, or they regard their chances for success as a gamble they are willing to take, electing the risk of failure in an academic program over potential success in an occupational program. More recently, some students hope for curriculum modifications which will decrease the risk.

The whole issue of occupations and education creates frustration in poverty belts of the major cities. People who need money and want status perceive occupations at less than professional level as demeaning, but often are prepared inadequately for higher education. They do not trust well-meaning advice, feeling that school personnel are "putting them down" when they advise "realistic" objectives.

Students are cynical about prospects for employment in some of the curricula they are encouraged to take: employers do not give preference to junior college graduates, and some require membership in unions which are selective on bases other than occupational competence. Some curricula are obsolete for the current employment market—retained more because of enrollment and staff availability than for opportunities for employment on completion. Counselors are unable to answer questions about many kinds of work, and the occupational library is apt to be out of date and lacking local information. Openings handled by the Placement Office are not related necessarily to the occupational curricula of the college.

Disparate values systems between contemporary students and the establishment also have contributed to indifference toward occupational education. Earning power—money— is assumed by the mature "depression" generation to be a primary goal, but contemporary students are questioning materialism. When the money argument is used by people who have left vocational employment to become teachers, students perceive this as hypocrisy, reinforcing distrust. Many young adults seek occupations which provide satisfaction in the doing, with less emphasis on the practicalities of monetary return. They care less about being rich than about being happy, and are trying to do more than just talk about it. Appeals other than money are cogent for the current generation.

The image of occupational education will change only when its rewards are defined in terms of the range of values and beliefs of the people to whom it is directed. For some, this will be money; for others it will be satisfaction in producing aesthetic or precision or useful products and services.

In either case, excellence is the objective and the Occupational Education Program must be maintained in this image by *deliberate design* and *continuing change*. When Occupational Education Programs demonstrate their own excellence by the inescapably visible achievements of their graduates, students will perceive them as first class rather than second rate alternatives. Then enrollments will rise without persuasion or protest.

The schools don't show the student any future but going to school forever. They should try to inform people about occupations and training requirements. — Student.

IN GREATER LOS ANGELES...

Education and Industry work together in planning college curricula and in employing people for productive occupations.

Several agencies collect data on business and industrial growth in Southern California and publish their findings.

Any resident of the Los Angeles Junior College District may learn almost any occupation, tuition free, in a college.

All the Los Angeles Junior Colleges provide guidance and placement services for students and graduates.

2. NOW TO THEN

1970-75

Teaching personnel have had substantial work experience in the occupations they teach.

Occupational education* is provided in classrooms and laboratories with appropriate equipment.

Remedial basic education for students inadequately prepared for college courses is given on every campus.

Federal funds for vocational education* always have provided considerable support for Los Angeles Junior College programs.

*Definition—Page—45

HOWEVER . . .	THEREFORE it is recommended that:
These other resources are not participating nearly enough in planning: Graduates of occupational programs. Students in occupational programs Teachers of occupational classes in contributing high schools Residents of the community Labor unions Employment office personnel	Advisory committees be reconstituted with broader representation.
The data are not classified by occupations or occupational groups, and do not give needs projections for employees with specific skills.	The Colleges develop cooperative programs with local employers to provide forecasts for curriculum planners.
Some curricula are given in only one college, often far away from the student, and College instruction sometimes is not concurrent with employer requirements.	Distribution of curricula throughout the district be analyzed as related to locations of employers and students, for possible relocation or additions, and Curricula and instructional programs be examined as related to current job descriptions and performance requirements.
Some students don't know services exist and others are skeptical about their value, and Too little is known about employment histories of graduates from occupational curricula.	Guidance and placement services be redesigned for a stronger partnership in the Occupational Education program, and A systematic program of placement and follow-up be established.
Some have not had experience recently enough.	Work sabbaticals, released time visits, and workshops be arranged for staff members.
Sometimes there is not enough equipment, and Sometimes it is obsolete.	Needs assessments for all curricula be compiled, and acquisition and replacement schedules be developed, and Work-study programs be developed to provide real experience on currently used equipment in cooperation with employers.
Ways of compensating for years of failure and deprivation have not yet been discovered, and Many students are "turned off" at the prospect of taking basic education, at which they already have known nothing but failure.	Augmented support be allocated to experimental programs, and A tutorial center be provided *concurrently with* occupational studies.
Procurement of funds often has depended on individual initiative, effort, and proposal preparation skills. Distribution among college programs has been uneven, and With VEA, 1968,* procedures are changed.	A workshop on characteristics of foundations and granting agencies and on proposal preparation be provided for college personnel, and A committee representing all colleges be authorized to determine priorities and allocations of funds for components of the Master Plan for Vocational Education as required by VEA 1968.

*Reference—Page—47

WHAT TO DO, AND WHEN

Strengthen existing viable programs:

Augment instructional programs which in fact are preparing students for employment in occupations which will continue to exist for a while and in which jobs are open.

Accelerate experimentation with and development of remedial and compensatory* education on all campuses.

Broaden the role of the Placement Services

To maintain:

Liaison with employers, unions, employment agencies.

Local employment market forecasts.

Records of job placements as related to occupational education in colleges.

Instruction in job search and application procedures.

To assist in:

Planning and evaluation of instructional programs as preparation for employability.

Plans for cooperative* and work-study* programs for students.

Arrangements for work sabbaticals for professional staff.

Redesign Vocational Guidance Service

Call it Occupational Guidance Center.

Make it a laboratory self-help and instant service operation.

Provide special training in laboratory operation for staff.

Provide instruction in decision-making processes.

Reconstruct Advisory Committees

Call them Planning and Placement Committees.

Broaden the representation.

Make them working committees with responsibilities.

Begin preparation for system* approach to occupational education.

Initiate a systematic organization analysis of all College and District functions related to occupational education.

Review all staff functions related to occupational education.

Provide system design and management training for personnel involved in all parts of a total occupational education program:

Curriculum Planners
Instructional Staff
Guidance Personnel
Placement Personnel
Evaluation Personnel
Funding and Budgeting Personnel

Design Occupational Education System.

Install, test, revise parts of Occupational Education System.

Continue Staff training.

Evaluate system on each campus and at District level.

Convert Staff training function to continuing evaluation -revision function.

HOW TO START

AND WHERE...

- Designate one person to function as coordinator among the colleges and as consultant to the colleges in the development of the Occupational Education System. He should be knowledgeable about system development, occupational education, junior colleges, business,industry, government agencies, unions, and community ... as close as possible ... *and* have strong leadership characteristics.

- Organize or contract for system development training for college staffs for initial two-year period, with a year plan to be added each successive year.

- Appoint a task group to compile and analyze information on distribution of occupational curricula in the colleges and as related to locations of employers and various student populations; and to make recommendations based on their findings.

- Appoint a task group to study District-wide approach to remedial and compensatory basic education through mass media.

- Organize District committees for cooperative and mutually supportive development of parts of the Occupational Education System – Curriculum Planning, Instructional Design, Occupational Guidance, Placement Services, Continuing Education for Staff, Evaluation, and Funding and Budgeting. These committees would work with the District Coordinator who would communicate needs, progress, and recommendations to the Superintendent and the Presidents.

- Designate one person to coordinate development of the Occupational Education System and to function as consultant to personnel designing parts of the System. He should understand purposes of the System and developmental procedures, occupational education, his college, and know local employers, union personnel, and people in the community.

- Appoint task groups to:

  Analyze existing instructional programs as related to placement records, job openings, local employment forecasts, and assess resources for work-study programs in cooperation with employers.

  – and –

  Inventory and analyze facilities, equipment, and personnel *assigned to each occupational curriculum:*

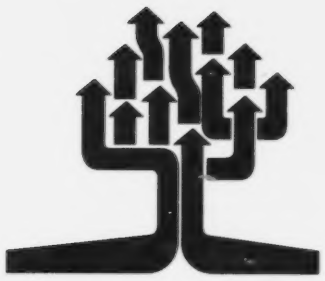
  Establish 5-year facilities priorities.
  Establish 5-year equipment replacement and acquisition schedule.
  Estimate 3-year projected personnel needs.
  Estimate 2-year materials needs.

TO PLAN A SYSTEM FOR OCCUPATIONAL EDUCATION...

planners must define a purpose and organize interrelated parts to accomplish the purpose. Guiding concepts in planning a system for occupational education are:

- **Purpose:** To prepare students for satisfying productive life-long endeavors.
- **Content:** Curriculum, Instructional Program, Guidance, Placement, Evaluation, Continuing Education for Staff, and Funding and Budgeting.
- **Procedures:** Provide functioning facilities, materials, and staff to form an environment in which a student makes decisions and acquires the necessary attributes to achieve the purpose of the program.

The content areas above are the parts of the Occupational Education System. Their interrelationships are diagrammed in Figure 1, page 8 . These parts also have purpose, content, and procedures, which are shown → More about content and procedures for each part is given on the pages after them.



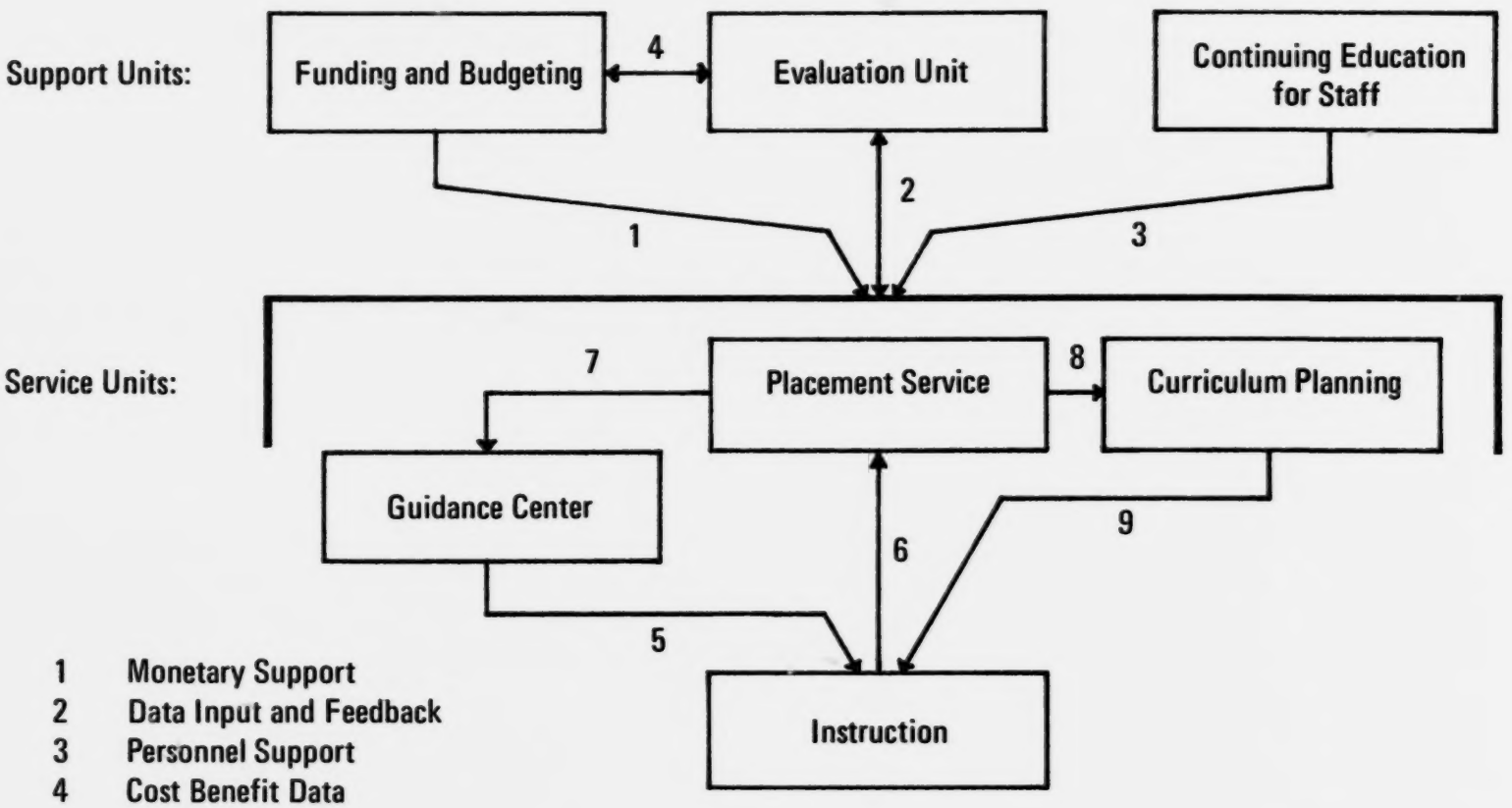
GUIDING CONCEPTS FOR PLANNERS

Of An Occupational Education Program

System Parts	Purposes
Curriculum Planning	To write specifications for learning programs in which learners will develop useful occupational competence.
Instructional Program	To design learning resources and environments which will enable learners to achieve the objectives of the instructional program.
Occupational Guidance	To specify environments, equipment, and materials to enable learners to make decisions and plans concerning their own occupational objectives and to learn the processes of decision making and planning.
Placement	To specify resources and environments which will enable students and graduates to find employment in the fields for which they are trained and learn the processes of job finding, selection, and application; to direct qualified students and graduates to employers who are recruiting personnel; to supply feedback to curriculum and instructional planners about the employment of graduates of their programs; to provide employment market data to educational planners; to assist in planning and coordinating cooperative and work-study programs; to assist in arrangements for work sabbaticals* for staff members.
Evaluation	To assess continually the Occupational Education System according to previously established criterion measures.
Continuing Education for Staffs	To prepare for keeping ahead of change and modifying existing programs as indicated by continuing evaluation.
Funding and Budgeting	To provide continuing financial support from all available resources for Occupational Education System; to provide cost-benefit and cost-effectiveness data for planners and evaluators.

*Definition—Page—45

Content	Procedures
Knowledge, skills, beliefs, and attitudes which will be exhibited by learners who achieve the purposes of the curriculum.	Data collection and processing by individuals and groups; formulation of specifications for subject matter and processes which learners will need to know, feel, and practice in order to achieve the purposes of the curriculum.
Knowledge, skills, beliefs, and attitudes which the learner is to acquire.	Designing objectives and learning experiences and evaluation procedures which will enable a learner to achieve the purpose of the Occupational Education System, and to know when he has.
Sources of information; criteria for evaluating information; information about human capabilities and potentialities and their relevance for occupational decisions; strategies for decision making; occupational information; information to assist in self-assessment at points of decision; expectancy of change; strategies for adapting to change; concepts of occupations as both employment and leisure activities and of learning as a life-long process.	Plan for maximum interaction between the counselee and an environment especially designed for compiling, selecting, and evaluating information and experience, all for purpose of making and reconsidering decisions.
Compilation of employment openings, qualifications of students who are enrolled in vocational programs and who will be entering the employment market; forecasts of occupational needs in the community; employer information; employment histories of students and graduates.	Communication with vocational instructors and with local business, industry, public agencies and unions; maintenance of employment information for students and instructors, and of curricula, instructional programs and student qualifications for employers; preparation of simulation exercises in job search, application, and interview procedures.
Statistical indices on enrollments; entry knowledge of learners and their skills on completion of instructional program; placements and later status of graduates; feedback from employers and graduates.	Systematic record keeping, information management, interviews, and committee work with students, graduates, and representatives from business, industry, public agencies, unions, and colleagues on the college staff.
System design, changing subject content and process, new media, advancing instructional technology, new concepts of learning environments, and expectancy of change.	Simulation workshops, work sabbaticals, self-directed work in resource laboratories for instructional materials, visits to industry, professional meetings.
Information on federal, state, and local capabilities and authorization for funding occupational education programs; information on foundations, their current interests, proposal formats, and dates for preparing proposals for various funding agencies; Planning – Programing – Budgeting System (PPBS).	Preparing and submitting proposals for funding; preparing reports as required for support of programs eligible for funding by federal, state, and local agencies; installing and maintaining PPBS.



1 Monetary Support
2 Data Input and Feedback
3 Personnel Support
4 Cost Benefit Data
5 Training Decisions
6 Jobs for Students and Graduates
7 Retraining Decisions
8 Input on Employment Requirements
9 Specifications for Instructional Designers

Figure 1. Functional Relationships Among Occupational Education Subsystems.

MORE ABOUT CONTENT AND PROCEDURE

Curriculum

Content specifications will be specific for an occupation, but units common to several occupations should be grouped in a core curriculum.

Basic skills are common to all occupational preparation. These include communications, mathematics, and information management, required in varying degrees and levels. Compensatory education programs which prepare educationally disadvantaged students for occupational curricula are included here.

Cluster skills are required within occupational groups and are a growing area for research and identification. The American Industry Project* at Stout State University in Wisconsin has developed an industrial arts curriculum around concepts common to many or all occupations. It attempts to provide an understanding of industry as an institution and a foundation for specific technical training. Machines, tools, and skills are introduced as contributors to development of concepts.

Another cluster concept program is under way at the University of Maryland.* Under this program occupational clusters are identified by common operations. Detailed job task analyses have identified three occupational clusters.

Construction	Electromechanical Installation and Repair	Metal Forming and Fabrication
Carpentry	Air Conditioning and Refrigeration Servicing	Machining
Electricity	Business Machine Servicing	Welding
Masonry	Home Appliance Servicing	Sheet Metal Work
Painting	Radio and Television Servicing	Assembly
Plumbing		

*Reference—Page—47

While both studies cited above involved industrial arts curricula, cluster concepts and skills which will provide choices for the learner in the changing world by giving basic preparation for more than one occupation seems an important consideration for curriculum design at the junior college level.

Curricula include knowledge, skills, beliefs, and attitudes required for entry occupations and for upward mobility within occupational hierarchies. Curriculum content accommodates multiple purposes: it specifies preparation needed for initial entry into employment; training for mobility upward within an occupation; retraining for alternative occupations; and sequential training for successive occupations within a job family. In the latter case, a learner could move from an entry occupation requiring little more than basic education into paraprofessional status by successive cyclical or concurrent work-study programs.

Procedures in occupational curriculum design include team efforts; employment market forecasts; and articulation with other institutions.

A variety of people working together and supplying special knowledge and skills will design the most useful curricula. Team efforts in curriculum planning involve working committees of people involved in instruction, placement, and evaluation. Content of a curriculum may be outlined by several specialist staff members working together and reviewed and revised by the total committee.

Curriculum planners must respond to the changing employment market. Employment market forecasts indicate trends which predict impending obsolescence of existing occupations; activation of new occupational fields; and changing emphases in hiring by employers in a local area. This information is necessary for planning curriculum changes and instructional programs.

Continuing data collection and trend forecasts must be provided for educational planners. Occupational Education program planners must receive information both from input and from receiving institutions.

It is inherent in good design of educational systems that entry characteristics of learners be known, and that feedback of results be fed into the system for evaluation and revision. Articulation with local high schools supplies two kinds of information important for curriculum planning: (1) expected entry skills of students who have had occupational courses before entering the college and (2) estimates of potential enrollment in occupational courses by students graduating from the local high schools and entering college. Communications between high schools and community colleges can help make both programs more useful to students, particularly, those with previously developed skills who need not take courses of study that cover material they already know.

From employers, educational planners learn the level of their own performance through the performance of graduates from the occupational programs they have designed. Liaison for information purposes therefore must be maintained. In addition, participation of local employers in working planning committees places some responsibility on them either for employing graduates or working with the college to modify curricula and instruction until graduates are sought for employment.

Instructional Programs

Content specifications in an instructional unit describe everything a learner needs to know or feel in order to achieve the objectives, and nothing irrelevant to those objectives. Predictions of needs of students in preparation for living productively during the next fifty years indicate growing emphasis on information management rather than information remembered. This means that students will need to know storage and retrieval methods rather than bodies of facts – it is more important to know how to locate needed information than to know the information itself. Evaluation and selection of information are more important than accumulation. With this orientation, process itself becomes the content of the instructional program and students are evaluated on what they can do, not on what they say they know through performance on subject matter tests. The content of all instructional programs is moving toward a pattern which has been inherent in vocational education for a long time.

Procedures in the design of an instructional program are the processes required to devise and order experiences for the learner, and include as by-products specifications for environment, facilities, and materials.

The basic listen-read-take-notes-answer-questions process of college learning is giving way to more dynamic activities which are changing the roles of instructors and learners alike. Teachers are becoming environmental designers, experience planners, resource persons; the student is focused on inquiry, discovery, experimenting, choosing alternatives, testing ideas, practicing skills and knowing satisfaction in achievement from his own efforts. The structured classroom is being replaced by the laboratory setting – long standard in vocational education – in which learners are proceeding at various levels of proficiency.

It should be made clear that what may appear to be a laissez-faire form of instruction, while the learner is exercising self-direction within the laboratory environment, is the opposite. The freedom of choice a student enjoys requires detailed advance planning if the instructional objectives are to be reached. Specifications for skillfully designed objectives and tasks for students require competence and ingenuity of the instructional planner.

Objectives must be analyzed and enroute* tasks devised and ordered so that a path to achievement is created for the learner:

- What must the learner do to achieve the objective?
- What environmental factors, facilities and materials will he need in order to practice or experience the necessary processes?
- What is the best sequence of events so that he knows and experiences all he needs before moving on to more complex or sophisticated processes?
- What alternative paths can be devised for learners, to allow practice in selection, decision making, and adaptation?

If current trends continue, teaching will become more an executive (not administrative) planning function by experts in learning, and less a process of information transmission, which can be accomplished better by machines which learners can use. The other part of the teaching role is continual program evaluation, and encounter and challenge with learners in exploring new ideas. Student operated multi-media systems are taking much of the drudgery of nonprofessional functions out of teaching. They present a challenge to the teaching profession to exercise its competence in designing learning programs which will give responsibility to the student for pursuing his own learning. A system provides an environment experience designed by professionals who devote full time to facilitating learning rather than giving instruction.

*Definition–Page–45

Vocational Guidance

Vocational guidance always has focused on making a decision, the assumption being that a good decision is relatively permanent. In the contemporary climate of change there is need now to focus on the decision-making process itself as preparation for choice points throughout peoples' lives. Traditionally, a counselee has been given information about himself and about occupations, and led by a counselor to consideration of alternatives and a decision. The decision itself has been the objective, and the door has been left open for further consultation when need for new decisions arises. Failure to focus on the steps is a lost opportunity for students to become independent and self-directed. A curriculum and instructional program for decision-making strategies is an important part of the Occupational Education System and an appropriate function of the Guidance Service.

Placement Services

The placement officer in the Occupational Education System is the key person to answer questions from employers and students:

- Who is a qualified individual I can employ to fill a job?
- Who is an employer who will hire me to fill a job for which my training has qualified me?

He also can help negotiate acceptance between the less-than-ideal graduate and the employer with the less-than-ideal job.

Preparation for job search and effective presentation of self in applying for jobs is an important need – particularly with disadvantaged students who may have more skill in job operations than in the middle class values of employment interviewers and personnel staffs. The Placement Service therefore has an instructional function which requires curriculum planning and development of learning materials in addition to liaison, employment, and program evaluation services.

Evaluation Unit

The evaluation team in occupational education is crucial to the most important single long-range procedure in the whole system: feedback for change, modification of the program, and adaptation to changes in employment and other community conditions. Faculty, students, and employers all depend on the evaluation function of the system to maintain quality in programs appropriate to the time.

Modification of a preparatory program of any kind over a long period is made necessary not only by defects in the program but by changing characteristics and needs of learners, and changing conditions outside the preparatory institution. The evaluation team is in a position to take information from the curriculum, instruction, guidance, and placement units and provide feedback to all of them so that the necessary evaluation-revision cycles can be continued to keep the system healthy, dynamic, and productive.

Continuing Education for Professional Staffs

As instruction for students moves toward environmental design and learning programs for self-direction, a program of continuing education also provides new resources and experiences for staff members.

System principles require learning and practice opportunities. Writing course objectives in observable, measurable terms is a skill which requires considerable effort to acquire. Other steps in the design of systems are equally difficult and it has been found that individuals excel in different ones, making team efforts more rewarding than design by a single person. Workshops for groups of teachers who will be working together have been found valuable and productive in improving instructional planning.

Concurrent with system design, new instructional media are part of the contemporary teacher's repertoire. Simulation* programs, computers, tape decks and older familiar media are presenting a range of choices which system oriented instructional staffs will find useful in planning learning environments. Opportunities to learn the full range and capabilities of these instruments and new ones as they develop are sought by teachers who are "keeping up" in their profession.

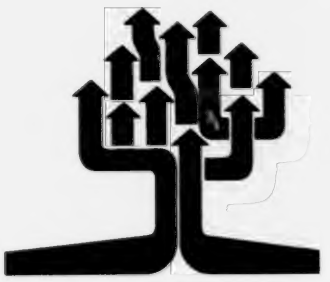
Current occupational practices also are necessary in a program designed to produce employable graduates; a system is no more contemporary than its planners and operators. Refresher experiences for professional staffs are achieved by visits, interviews with employers, and temporary work arrangements.

Funding and Budgeting

Federal funding for vocational education in the past has been based on reimbursement claimed for objects and services spent in support of qualified programs. Under the Vocational Education Act of 1968, appropriations will be allocated in support of Master Plans which have been developed in advance of funding years. To qualify for this support, the College District will develop a schedule of priorities, and it is the recommendation of this report that a system design for a total program be adopted and developed.

Other sources of non-local funds include private foundations and other Federal acts. These require preparation of specific ritualized proposals – a reality of contemporary life in the arts, sciences, and humanities as well as the technologies. Proposal writing itself is an art and a technology. Personnel who have the talent and who take the time to inform themselves on the requirements of funding agencies are needed on every campus. A workshop for developing these talents may be useful.

New arrangements for budgeting and accountability are being adopted by school systems, and may be required in the Colleges in the future. Under the Planning-Programming-Budgeting-System (PPBS), budgeting and accountability are accomplished in terms of functional components rather than by objects and services purchased for a total program. Adoption of the system approach aids in budgeting for long-range program effectiveness by relating expenditures to objectives and achievement.



*Definition—Page—45

about people . .

in a system, the efforts of personnel performing various tasks are coordinated. People operating a system for Occupational Education have discrete but interrelated functions, procedures, and resources. The personnel are listed below, and what they do is described in the next pages.

Planning and Placement Committees
Placement Coordinator
Instructional Designers
Guidance Personnel
Professional Staffs: Continuing Education
Evaluation Unit

A model for each system component also is described.

PLANNING AND PLACEMENT COMMITTEES

Functions

Produce new curricula which meet the needs of employers and students.

Specify modifications or time for deletion of obsolescent curricula.

Produce for instructional planners specifications of skills and knowledge which graduates of each occupational curriculum will need for employment and successful performance on the job.

Monitor employment of graduates.

Procedures

Compile information.

Consider crucial elements for decision:

Needs of business, industry, and public agencies
Union requirements and limitations
Students' interests
Availability of staff
Availability and costs of facilities and equipment
Relationship with other components of program
Relationship with high school programs
Relationship with programs of other colleges
Relationships with cooperating employers

Formulate curriculum purposes and objectives.

Formulate recommendations and justification for adoption, modification, or deletion of curricula.

Analyze employment figures and placement of graduates.

Analyze effectiveness of curricula, instruction, and placement as coordinated functioning parts of the System.

Resources

Reports of occupational trends in the community.

Placement Service reports.

Evaluation Unit reports.

Reports from high schools on student decision trends.

Projections of economic and social change and technological developments.

Student opinions and preferences.

Advisory committees of employer representatives are traditional with junior college occupational educators in California. They normally have met with college personnel once or twice a year to hear progress reports on changes as recommended at previous meetings and to discuss curriculum development. They have functioned as the principal but often token ties between the colleges and the economic support of the community. More honorary than working committees, they show a record of instability and decline in most colleges of the Los Angeles District.

These committees can be reconstituted with fuller community representation and with tangible responsibilities which make them central to evaluation of the effectiveness of each occupational program within a college. With responsibilities in planning curricula and monitoring employment of graduates, they will function as Planning and Placement Committees, one for each occupational curriculum and superseding the less structured Advisory Committees. With a major change in function, the change in name seems advisable.

MODEL

CURRICULUM PLANNING AND JOB PLACEMENT . . . .

bracket the instructional program in the evaluation-revision process inherent in an operational system for occupational education. The two functions are related as input and feedback. If a curriculum is not appropriate or is poorly designed, there will be no jobs for graduates. If a curriculum is appropriate and well-planned, and the instructional program accomplishes well-designed objectives, then jobs should be available for graduates. It is important that the same individuals and groups share responsibilities for both functions. The Planning and Placement Committee with its multiple representation has these responsibilities.

The Planning and Placement Committee is composed of representatives of unions, employers, the community, graduates of the college who are working in their fields of training, students currently enrolled in occupational curricula, high school occupational teachers, members of the college teaching staff, and heads of other components of the Occupational Education System. The Committee for each occupational curriculum examines significant trends, reviews college courses, studies reports from the college Placement Service and the Evaluation Unit, writes specifications for new curricula, and recommends continuance, change, or deletion of existing ones. The concept of a Planning and Placement Committee provides opportunity and challenge to employers and unions to take responsibilities in public education. Participation in planning curricula carries a commitment to employ and admit to membership a reasonable number of program graduates. Membership on the Committee changes as employment patterns in the community change.

The Committee analyzes reasons for lack of jobs for graduates of occupational curricula to locate the points of breakdown of the System, and recommends revisions to restore continuity among curriculum, instruction, and placement.

If graduates of an occupational curriculum are not finding employment, the curriculum is compared to current job descriptions. If the curriculum objectives and current needs of employers seem consistent, then the objectives of the Instructional Program are examined and, if indicated, recommendations for change are made. If curriculum and instruction are consistent with current job requirements, then Placement Service operations are examined, and a task group may consult with employers to determine if needs are declining and explore with unions changing membership requirements. The search for causes of malfunctions is crucial to the validity of the education-employment relationship and to the Occupational Education System.

We need more direct participation by industry in the fields of education and placement. – Faculty member.

For occupational programs to remain viable they must keep up with the state-of-the-art as it exists in industry. In fact, schools should be ahead of industry in general, then students could easily be placed on jobs. – Dean.

PLACEMENT COORDINATOR

Functions

Provides information and services which will result in employment of students and graduates of occupational curricula in training-related jobs.

Assists employers in their search for qualified personnel from the colleges.

Conducts local employment market surveys and maintains information on state and national trends in manpower needs.

Provides an environment in which students learn job search, selection, and application procedures.

Helps plan and evaluate occupational education programs as preparation for employability.

Assists in arrangements for cooperative and work-study programs.

Assists in arrangements for work-sabbaticals for staff members.

Procedures

Maintains liaison with employers and unions in the local area.

Maintains liaison with California State Employment Service.

Arranges interviews for jobs.

Maintains job information.

Provides instructional materials for students to learn strategies for job finding and selection and practice in filling out application forms.

Provides simulation interviews for jobs.

Provides information on dress and manner for job interviews.

Assists in curriculum planning for job placement.

Keeps records of job openings, job applications, jobs filled and other data which contribute to evaluation of Occupational Education System.

Resources

Printed documents

Application forms

Computer storage facilities

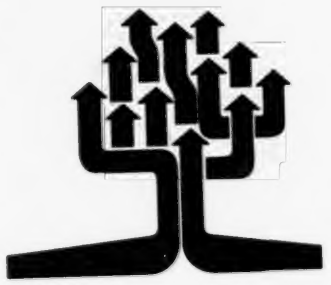
Simulation programs

Employers

Unions

Placement officers generally have not considered themselves as part of the instructional program of the college, and yet they provide a vital link between instruction and achievement of the objectives of the program. With emphasis placed on process more than content, the procedures of job applications and interviews becomes an important curriculum component. In a total system whose purpose is to lead to life-long and changing occupational endeavor, the placement function represents the culmination of the instructional program and a place to learn important processes.

The Placement Coordinator is a member of all Planning and Placement Committees, which are responsible for establishing curricula to specify what a student must learn to qualify for employment. The Committees also are committed to working with the Placement Service and monitoring employment of graduates of the curricula they plan.



MODEL

A PLACEMENT SERVICE . . . .

is located adjacent to the Occupational Decision Center so that students using both services have easy access to the same occupational materials.

Simulation experience is provided applicants. Various forms from government agencies and industry are available for students to fill out. The information is placed in a data base, and a computer simulated interview provides practice and evaluation for the student before he goes out for an appointment. Colleges which do not have the computer facility have dual track tapes on which a student can record his responses to a pre-recorded interviewer and listen to the playback for self-evaluation.

The Placement Service works closely with the Evaluation Unit, providing systematic records of job openings, student applications, successful placements of graduates of occupational programs, and recycling of students and former students through the office. The Placement Coordinator charts employment trends in the community and provides this information to the Planning and Placement Committee (of which he is a member), maintains liaison with local employers, and assists the instructional staff in work-study arrangements for students and for work-sabbaticals for themselves.

Also charted are employment records of former students who are followed systematically through their careers, with particular notice to mobility patterns. Data on all users of the Placement Service are stored in a computer data base so that retrieval of this information is routine. From this data base, the computer facility prepares an annual mailing to former students with questions for follow-up records, and a reminder that the service still is available to them if new needs arise.

State clearly the relationship between courses of study and various occupations. That is, what exactly a student must take to be considered for a job opening and comment upon who would be willing to hire a j.c. graduate with no experience in his field of interest. – Student.

Expand employment services for students, with increased employer interviews held on campus in all subject areas. Expand services available to employers so that college students have the opportunity to become part of a company on a part-time or training basis as a way of helping them continue in or change selected occupations. – Faculty member.

Develop a coordinated placement service with industries in each occupational field, furnishing not only assistance in initial employment, but also follow-up for graduates for promotional or transfer opportunities. – Faculty member.

We are investigating methods of using the computer to assist with statistical records and follow-up. A system is being devised to enable us to match qualified students to job offers related to the student's major field. The demands for people trained in occupational and vocational fields is increasing to the point that hundreds of positions are unfilled each year. – Employment Coordinator.

INSTRUCTIONAL DESIGNERS

Functions

Design:

Instructional programs which will prepare students for immediate employment in their respective fields of training.

Supplemental programs for employed persons who wish to qualify for higher level employment or who wish to learn alternative or additional occupations.

Compensatory education for students who lack skills which are prerequisite to effective learning in college occupational education programs.

Instructional programs which will be especially useful to persons with physical handicaps.

Procedures

Formulate learning objectives which are observable and measurable for each course in the curriculum.

Develop criteria to determine when students have attained learning objectives.

Develop criteria for entry behavior and physical characteristics which are relevant for various occupational curricula.

Analyze learning tasks.

Determine methods, media, and materials which provide the most efficient learning environments for specific learning tasks.

Design learning system.

Assess students' entry behavior and limitations.

Test learning systems.

Assess student performance after learning experience.

Revise as needed to enable students to achieve objectives formulated in step 1.

Continue evaluation and revisions as needed.

Resources

Professional staff in the college.

Professional, trade, and technical library materials.

Consultants from employers and unions.

Instructional Media.

Instructional Resources Center.

Instructional Planners are charged with establishing observable objectives for learners and using a variety of media and methods in designing tasks and routines for efficient achievement of objectives.

Occupational education provides unique substance for utilization of advanced educational media and for demonstrating new roles for teachers. With a laboratory tradition, occupational instructors are adaptable to contemporary concepts of individualized instruction and simulation. These are needed especially now to provide opportunities for a range of students – including the educationally disadvantaged and physically handicapped – and to strengthen transfer from the training program to employment.

With higher technologies in the employment market, strong identity characteristics in the instructional program become necessary – there is less cushion for improvisation when greater on-the-job precision is required. This has given support to the development of simulation – non-risk experience – and is giving current impetus to work-study and cooperative programs arranged by employers and educational institutions.

MODEL

INSTRUCTIONAL DESIGN . . . .

is accomplished by teams drawing on earlier training and experience, recent work sabbaticals, other continuing education, and information and recommendations supplied by the Planning and Placement Committee (on which instructional personnel also serve).

In applying system design procedures, individuals vary in their preferences and capabilities for the various steps: some people, for example, have difficulty formulating observable, measurable objectives, and others do this quite easily. The tasks are divided for first formulations, then the total plan is developed jointly by the instructional design team with assistance from college specialists, such as a psychologist, psychometrist, media specialist, librarian, or Health Office personnel.

The learning system is designed by the team and materials are prepared in an instructional resources center under direction from team members. This facility is staffed with an illustrator, a media technician, and a clerk typist. It is equipped with cameras, audio and video recording and playback units, photo reproduction units, typewriters, and other equipment and supplies for producing instructor designed learning materials. A model carrel of the type used by students is used by designers to test instructional materials before installation.

Cooperative and work-study programs are an important part of the occupational education program and are arranged with the assistance of the Placement Service through contacts with business, industry, public agencies – including the school system itself – and unions. Specific patterns of concurrent alternating study and longer employment periods vary with the curriculum according to objectives formulated by the instructional design staff. In occupations which require costly and changing equipment, cooperative employers provide the facilities in their own establishments on which students learn through various work and study schedules. This cuts costs in the College and insures learning under practical and current conditions.

Instructional objectives and assessments of entry and post instructional behavior of students are stored in the Evaluation Unit data base by the instructional staff. Revisions of instructional programs are based on analyses by the Evaluation Unit.

Why not let a school rent equipment instead of buying it and investing money in what will be obsolete in five years? – Faculty member.

Don't tie up capital on specialty equipment. Don't purchase expensive equipment when a machine can be learned in a few hours. Instead, develop an industry-education program whereby students can be taken to the machine in industry. – Faculty member.

There should be a semester or two of work experience. The first year obtain knowledge of your trade and the second year work and gain the necessary experience and credits for the second year. – Student.

There should be more classes that provide the students with an opportunity to work on their own. Most classes are run with the thought that students must have everything spelled out for them. – Student.

GUIDANCE PERSONNEL

Functions

Provide resources and environments which will enable students to make occupational decisions and to learn the decision-making process.

Procedures

Arrange interviews, discussions, dialogues, field trips, work sample experience, and tests.

Provide printed documents, films, slides, filmstrips, recordings, television programs, and simulation programs.

Help students evaluate performance data.

Help students learn to formulate alternatives.

Resources

Professional library

College staff

Placement Office

People working in occupations

Students

Business offices, industrial plants, public agencies, unions

Demonstrations of new materials and media

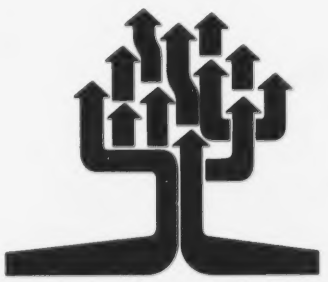
Workshops

Work sabbaticals

Personnel assessment instruments

With effective education for democratic participation in decisions and self-determination in life style, students now have a large voice in their own affairs. Both the term and traditional practices of "vocational guidance" are outmoded. The idea of an advisor "counseling students into" particular occupational curricula perhaps never was appropriate, and certainly the strongly structured vocational guidance procedures which were useful after World War II are not acceptable for decision making by contemporary students.

Occupational Decision is a more appropriate concept now, for it emphasizes an internal process over externally imposed direction. There is little temporal urgency for quick decisions, for most students plan to stay in school for a year or two, and the economy has jobs for the educated. A laboratory for unhurried decisions seems more in tune with the times and student expectations than does the counselor controlled interview.



MODEL

AN OCCUPATIONAL DECISION CENTER . . . .

is a free-ranging environment appropriate for inquiry and discovery which allows time for considering alternatives. It is available without appointment through the normal school day and evening, and is staffed with counselors who assist students in a laboratory setting.

The Center is equipped with occupational information in colorful folders, clearly labeled, arranged on display racks for easy browsing; motion picture projectors with a library of occupational and relevant biographical films; filmstrip and slide projectors with appropriate materials; tape decks with tapes about and by people in various occupations; television for viewing special programs; State Employment Service bulletins; racks of civil service announcements and want ad sections of daily newspapers; catalogues of colleges, professional schools, technical schools, adult education centers, and special training programs; lists of objectives of occupational curricula and courses; a file of biographies by occupation available in the College library.

Films and all other facilities are available at all times on request by individuals and groups.

Counselors in the Decision Center consult without appointment with students to determine what help is sought and to respond immediately *to the need expressed at that time*. There is no pre-determined procedure; the decision process starts with an activity which seems most relevant to the student – viewing films, talking with people, taking a test, reading, listening, or just finding out what resources are in the Center.

Tests, if given, are administered singly at well spaced intervals so that counselor and student can weigh each result and assess its significance before another test is considered.

The Center provides a climate of unhurried exploration and data gathering; it is a place for exchange of ideas, inquiry, discovery, and evaluation.

In decision making, as well as in learning, an individual needs to proceed at his own pace and have available many resources for independent exploration, with assistance when desired. With good resources, time to think with others, and unhurried support of patient counselors who respect the independence and recognize the level of maturation of each person, the steps in good decision-making are practiced while specific occupational goals and educational plans are being formulated.

The Decision Center requires special facilities and staff. It is housed in space similar to a library, with one or more projection and listening areas, as well as a room for reading and one for small group discussion or individual consultation with counselors. The Center is located centrally, to encourage students to drop in for short as well as longer periods of time, and is adjacent to the College Placement Service, with which it shares employment market information.

Counselors who staff the Occupational Decision Center are oriented to the guidance laboratory concept and keep themselves informed on materials and equipment relevant to occupations, and with computer storage and retrieval and simulation programs.

The Center has a pre-planned design for continuing evaluation of its services. Systematic records are kept of usage: users' characteristics, objectives, educational plans, academic records, subsequent employment, and returns of students and graduates for recycling the decision-making process as needed through changes in life patterns or occupations. These are stored in the data base maintained by the Evaluation Unit.

Get counselors who know the needs of the industrial community . . . to teach students what outside employers need. – Student.

Expand guidance to truly serve students and community. Occupational information center with a vocational counselor available on request. Material available in all media with information on occupation and persons in it. Staffed by vocational counselors. Coordinated with the industrial community. Tours of business and industry for students. – Counselor.

PROFESSIONAL STAFF: CONTINUING EDUCATION

Functions

Maintain current content and practices in occupational education programs. Includes subject areas, specialized services, instructional media, and system planning and management.

Procedures

Workshops

Work sabbaticals

Visits to business, industry, and government agencies

Media demonstrations

Reading

Resources

Professional and trade documents

Local business, industrial plants, and government agencies

Unions

Manufacturers and distributors of instructional materials and media

System training personnel

It is recognized that the design of educational systems requires learning and practice, and that periodic updating is necessary for professional staffs in a changing world – this applies to counselors, coordinators, and administrators as well as to the teaching faculty. Specialized areas and technological developments which can contribute to learning in college settings are considered equally important.

Set up a teacher swap with other colleges in the area, where an instructor would teach one course at another college to help develop intercollege communications. – Faculty member.

Establish with industry a work-teaching period each three years to keep instructors current . . . a cooperative program that will allow an instructor to teach while working at an industrial facility. – Faculty member.

MODEL

CONTINUING PROFESSIONAL EDUCATION . . . .

helps occupational educators to keep current with their own fields by visits to relevant business and industrial organizations and public agencies for observation and discussions, and by regularly scheduled work sabbaticals. These are arranged without financial sacrifice, and each faculty member is required to participate for periods of time and at intervals that are determined individually for each curriculum or service by a committee of professional personnel, administrators, and advisors from the community. It is recognized that change occurs more rapidly in some fields than in others.

The college professional staff also keeps informed on new educational media and the latest equipment used by industry and business. This is accomplished by demonstrations, workshops, visits, and reading. A professional library for staff use is maintained by the college, with subscriptions to professional, trade, and technological journals in each curriculum area and in education.

Each year the college district arranges a day or more of demonstrations and exhibits by manufacturers and publishers. This is timed so that each professional staff member may attend long enough to evaluate displayed equipment and materials in reference to his own field, and to discuss with commercial representatives applications and costs of new products. This annual event helps maintain high quality instruction and services by suggesting alternatives where evaluation has shown need for revisions.

Professional staff members also are encouraged to observe instructional programs in other colleges and to draw on each other's creative efforts. Exchange appointments for a year or two between faculty members on different campuses are arranged when requested by the people involved, to allow a temporary change of environment without a transfer and at no loss to the District.

One-year job exchanges are arranged for college staff members and qualified people working in the field. This program aids close liaison between the college and employers in the community. By working within a company, an instructor observes the skills and knowledge currently needed by his students; by working within the college, the company man recognizes the merits of the college program for preparing productive employees, and contributes in a practical way to the design of the instructional program.

EVALUATORS

Functions

Evaluate Occupational Education System.

Maintain data base on all system components.

Provide feedback for revision.

Procedures

Comparison of feedback information with objectives.

Dissemination of findings to system personnel.

Resources

Data from Instructional Program, Placement Service, Occupational Decision Center, Planning and Placement Committee, and fiscal personnel.

Evaluation in system science determines whether or not *the system* in fact is meeting the objectives set for it and at what cost. Objectives in education are stated in terms of student achievement, and evaluation consists of assessing student performance before and after involvement in the system. The "before" measure accomplishes two things: it determines the level at which the student is prepared to enter the system and it verifies that measured or observed behavioral changes have occurred during experience with the system. The "after" measure allows comparison with a previously stated criterion of successful performance.

Level of performance by an individual may be stated as a percentage of acceptable responses, as a time for performance, as a product quality level. A system is judged by whether or not a previously established number and level of successful performances have been reached. In education this means the number of students who achieve the system objectives. For example, a criterion may require that 90% of students achieve the objectives at a 90% level of optimum performance. An important point is that the criterion is set in advance and that the system is modified after successive evaluations until it does reach the required level.

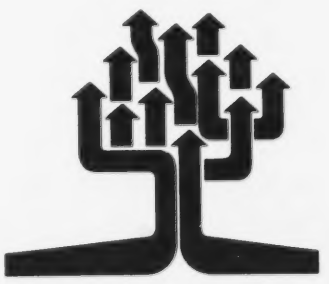
MODEL

THE EVALUATION UNIT . . . .

is a clearing house for data related to quality control in the occupational education program. With a large computer facility, the Unit stores data on system performance and notifies the professional staffs when the objectives which they have set for their own programs are not being achieved at levels they have specified. This is a necessary service in the continuing evaluation and revision cycles which characterize the Occupational Education System.

The Evaluation Unit also assists in the instructional program itself by processing entry performance on all students in occupational curricula and telling the instructor the appropriate level at which to start a new student. The procedures for this information management are worked out in advance by the instructor and a computer programmer; the instructor determines the prerequisite performance of each level of his instructional program, the programmer translates the instructor's specifications into computer procedures; the computer makes the necessary comparisons between student performance and prerequisite performance and prints out recommendations based on criteria specified by the instructor.

Information also is stored and processed to provide feedback to personnel in the Occupational Decision Center and the Placement Office. In each case, objectives and criteria are established by the professional staff, the programmer and the computer process, compare, and give feedback. With this service and facility available, professional staff time is conserved to allow updating and revision for improvement of all system components.



STUDENTS AND COMMUNITY

The foregoing pages have described an Occupational Education System which is generalizable to any junior college. The System provides for participation by three large categories of people both as learners and planners – professional staffs, students, and the community. Evaluation-revision and continuing education provisions support the concept of life-long learning and preparation for change, no less for any one group than for another. At the same time, all must support the system and contribute to its development. Figures 2 and 3 show the roles of the students and the community in the Occupational Education System.

Figure 2 shows that a student, on admission to the college, proceeds to instruction or first to guidance then to instruction. He may use the Placement Service, secure employment, and later be readmitted for retraining as needed. While a student and as a graduate he serves or is represented by peers on the Planning and Placement Committee for his major.

Figure 3 shows community participation in Curriculum Planning and in monitoring employment of students and graduates using feedback data from the Placement Service and the Evaluation Unit. The System also is assisted by work-study cooperation to supplement on-campus instruction; interviews and local occupational information in support of the Guidance Center; arrangements for work sabbaticals, visits, and interviews to help staffs keep current with their own fields; and by funding and budgeting through taxes and the elected Board of Trustees.

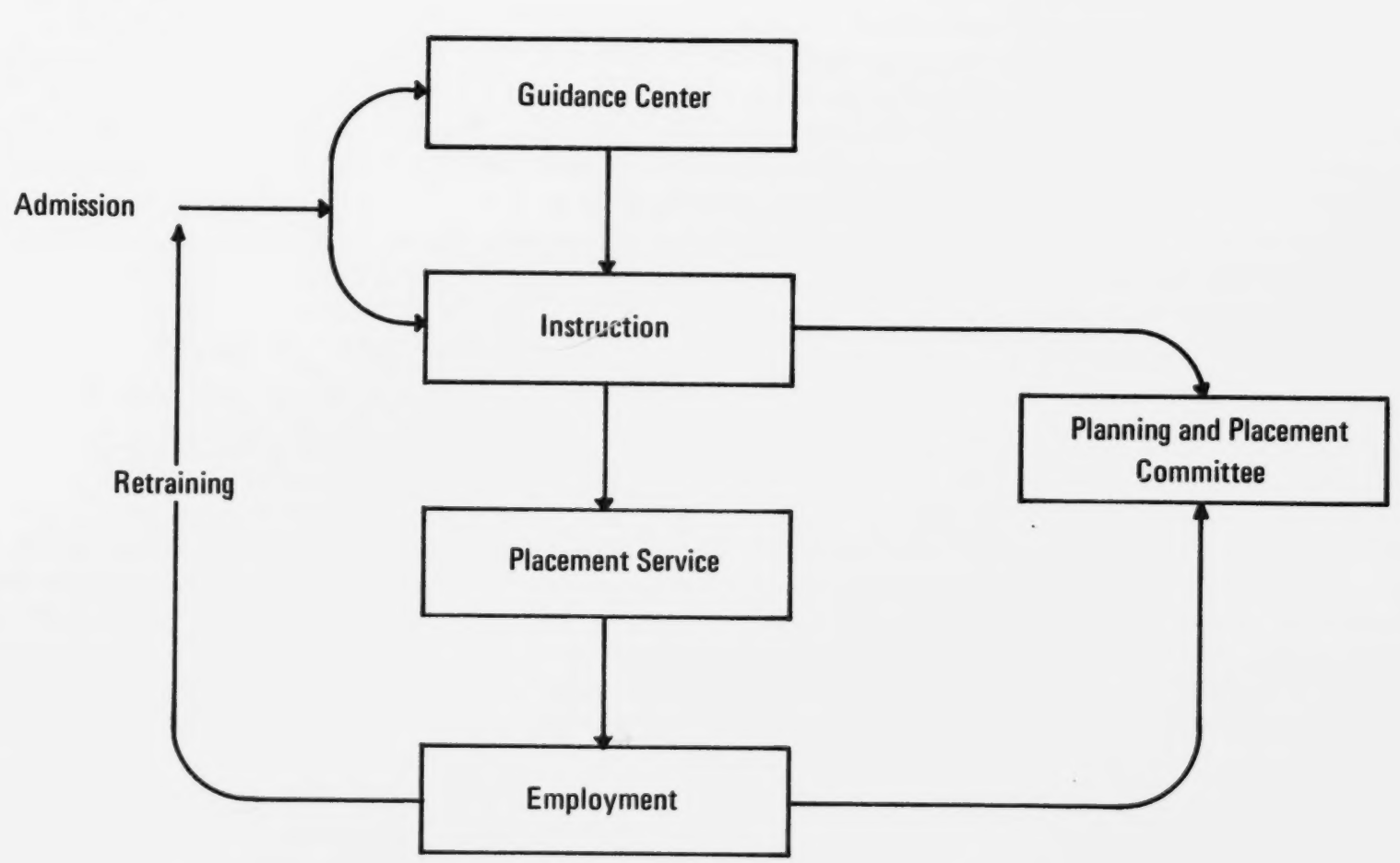


Figure 2. Student Participation in Occupational Education System.

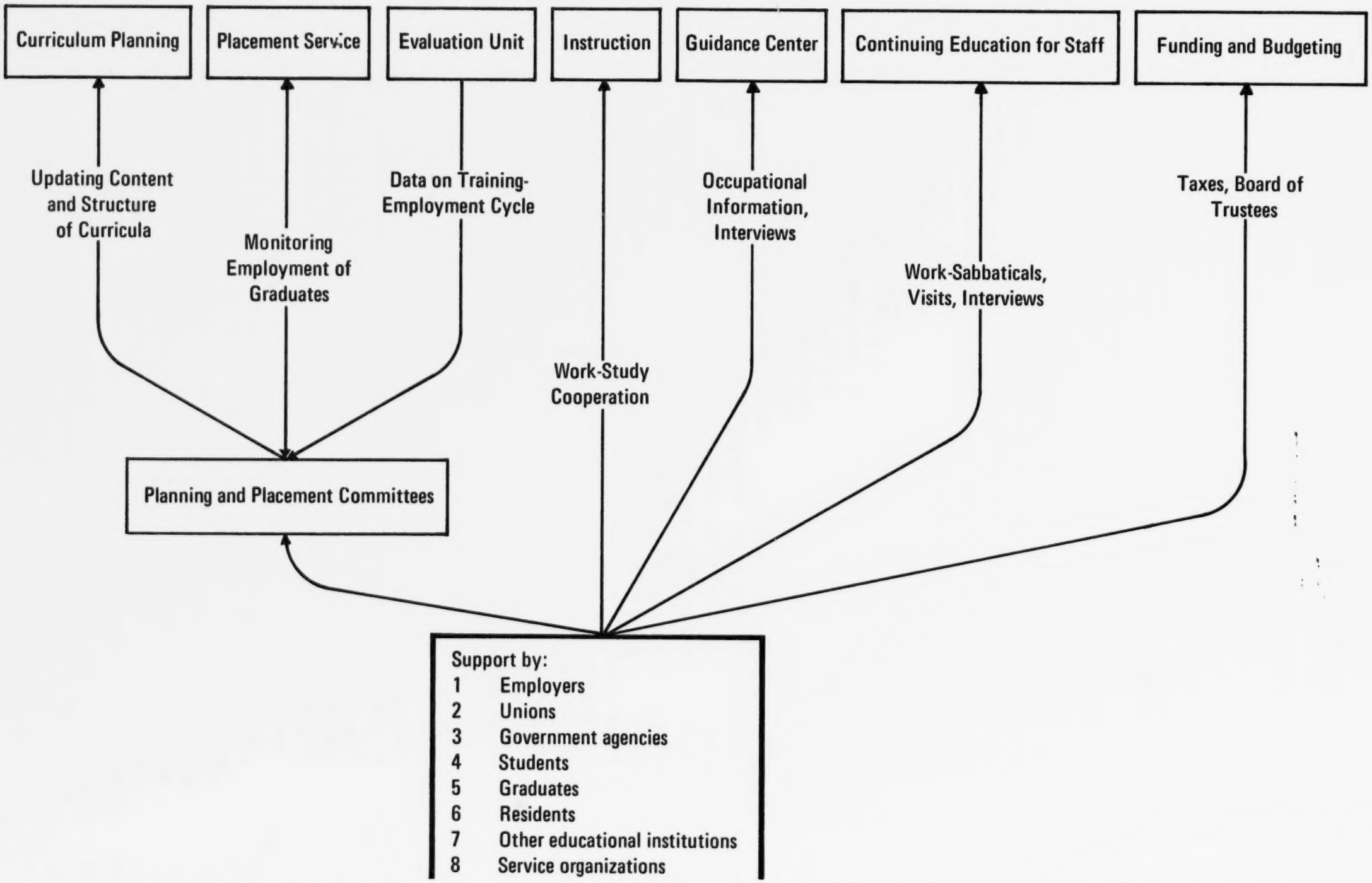


Figure 3. Community Participation in an Occupational Education Program.

SYSTEM SCIENCE . .

A system is defined as a functioning organization of interrelated and interacting components purposefully designed to achieve specific, formulated objectives. System science is a discipline which requires formulation of objectives which are observable or measurable, stipulation of criterion measures, design of procedures for achieving objectives, and functional evaluation. In education this means that goals are set for learners; methods of determining learner performance in relation to established goals are devised; an instructional program is provided; and the system is evaluated by comparing learner achievement with specified goals. Discrepancy between achievement and objectives is interpreted as a failure of the system, not of the learner. If the system does not work, it is modified until it does. This hard-headed approach places responsibility on educators to devise functionally successful programs, and to know when they have or have not done so.

System design is a pragmatic application of the scientific method. It requires a set of skills which can be learned in an organized instructional program. It has been called *common sense by design*, but is systematic and is validated by empirical methods rather than by anecdote and faith. It places no limitation on content or methods of an instructional program – in fact the ingenuity and versatility of the system designer may be challenged by successive programs which fail to meet objectives by the criteria established. It makes clear distinctions between instruction and learning – if learning does not occur, then the instruction must be redesigned. It discourages doing more of the same thing, requiring, instead, alternatives, decisions, revaluation, and revision. If competently and conscientiously practiced, the system approach inevitably results in knowledge of success or failure and in improved programs.

A system requires purpose, content, and process. The purpose describes the intent of the system. Content consists of components organized to accomplish the purpose. Process in a functioning system is the interaction of the components in achieving the purposes.

Each system operates in a larger context and must be sensitive and responsive to changing conditions as communicated by its own evaluation and feedback channels. It also consists of subsystems which are designed to carry out specialized functions necessary to the purposes of the system. For example, a vocational education program is a system within a college and its subsystems are curricula, instruction, guidance, placement, continuing education, evaluation, and funding.

In a total system, all components must work well together. A subsystem which functions in isolation but not in the system is redesigned.

Basic concepts in system design are translated into the following steps for application to education:*

- Formulate objectives: State what learner is expected to do, know, believe or feel as a result of his learning experience.
- Develop test: Devise measures which will indicate whether or not learner can do or knows, believes, or feels what objectives specify.
- Analyze learning tasks: Determine skills, knowledge, beliefs, or feelings which are prerequisite to beginning the program.
- Analyze functions: Identify what must be done to enable student to do what is necessary to meet the objectives.
- Component analysis: Determine who or what will serve best in the system to enable the learner to achieve criterion performance.
- Design system: Determine objectives, content and processes which will enable student to achieve objectives of the program.
- Install: Put system in operation.
- Test: Administer criterion measures to learners to assess effectiveness of program.
- Revise: Modify system to correct deficiencies revealed by performance tests.

These are the basic steps in system design, whether they be for a space flight or an educational program. They are a formulation of the procedures recommended in the previous sections.

*Adapted from Banathy. See reference, Page 46

3. THEN TO NOW, 1962-69

Many of the ideas in this report were derived from responses by people on the college campuses to questionnaires distributed in March 1969. Students, administrators, instructional personnel, counselors, and placement officers all have answered questions, and records personnel have provided statistical data. Many responses to open-ended questions are built into the system design described in Part 2. Many are listed in some of the following pages. Some numerical data also follow.

Some of the tables are incomplete. Personnel supplying historical data were instructed specifically to use only available compiled records and not to construct responses from old original sources such as roll books. It is felt that knowledge of what records are not being kept is as important for this report as are the statistical summaries which are available.

In the following pages, blank spaces indicate unavailable information. Unreturned questionnaires or unanswered questions are indicated by *no response*.

TRENDS, 1962–68 . . .

Placement service data are given in Tables 1 to 8. A need for consistent record keeping is indicated by the number of blank cells in these tables. Assuming that placement in training-related jobs is the most important criterion of success of the Occupational Education Program, top priority should be given to restructuring the functions and the record keeping methods of Placement Services.

Table 1. Number of Students Registered for Employment

	1962–63			1964–65			1967–68		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
City			11,049[1]			11,656[1]			12,135[1]
East L.A.	483	397	880	692	527	1,219	897	685	1,582
Harbor			841			1,218			1,117
Pierce				1,354	695	2,049	1,855	1,231	3,086
Southwest[2]							125	100	225
Trade Tech									
Valley	1,364	654	2,018	1,835	998	2,833	1,594	1,293	2,887

[1]Tabulation of visits to employment office.

[2]Opened Fall 1967.

Table 2. Number of Students Placed in Jobs

	1962–63			1964–65			1967–68		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
City	1,193	856	2,049	1,266	1,093	2,359	1,760	1,349	3,109
East L.A.	287	216	503	519	372	891	1,143	812	1,955
Harbor			478[1]			625			637
Pierce						2,562	1,810	691	2,491
Southwest							35	35	70
Trade Tech			1,406			1,445			2,558
Valley	820	318	1,138	1,083	499	1,582	951	762	1,713

[1]Estimate. Could be higher.

Table 3. Number of Students Placed in Training Related Jobs

	1962–63			1964–65			1967–68		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
City	18	108	136[1]						
East L.A.	116	171	287	159	197	356	312	397	709
Harbor				Average of 72% over all years.					
Pierce									
Southwest									
Trade Tech			960			909			1,380
Valley									

[1]Based on 1963 survey of graduates: 34% response.

Table 4. Number of Applicants Not Placed in Any Position

	1962–63			1964–65			1967–68		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
City									
East L.A.	139	96	235	169	142	311	227	192	419
Harbor			905[1]			1,125[1]			1,674[1]
Pierce							1,333	688	2,022
Southwest									155
Trade Tech									
Valley	544	336	880	752	499	1,582	643	531	1,174

[1]Estimate. May be less.

Table 5. Number of Openings Registered by Employers

	1962–63	1964–65	1967–68
City	829[1]		5,782
East L.A.			
Harbor			
Pierce	1,692	3,534	6,146
Southwest			
Trade Tech			
Valley	2,057	2,893	3,754

[1]Full-time permanent only.

Table 6. Requests from Employers Which Could Not Be Filled

	1962–63	1964–65	1967–68
City:			
Clerical	829		
Bookkeeping	69		
Architecture	14		
Engineering	21		
Merchandising	48		
Management	14		
East L.A.:			
Stenographer		56	67
Mechanical		79	92
Medical Records Technologist		27	37
Business Manager		81	96
Typist Clerk		102	119
Harbor			
Pierce			
Southwest			
Trade Tech			
Valley			

Table 7. Students Employed in Jobs Related to Major

	1962–63	1964–65	1967–68
City			
East L.A.:			
Business	86	98	102
Trade/Technical	0	0	0
Agriculture	168	190	
Service			201
Harbor			
Pierce			
Southwest			
Trade Tech:			
Business			79
Trade/Technical	737	783	940
Service	123	127	160
Valley			

Table 8. Majors of Student Applicants Not Placed

	1962–63	1964–65	1967–68
City			
East L.A.:			
Business	70	92	88
Trade/Technical	109	126	194
Agriculture	0	0	0
Service	197	174	202
Harbor			
Pierce			
Southwest			
Trade Tech			
Valley			

Advisory committee meetings for the target years and the current year are tabulated in Table 9. Their numbers are declining in four colleges, have held to consistently high figures in one, and nearly doubled in 1968–69 over previous years in one.

Table 9. Advisory Committee Meetings (Occupational Curricula)

	1962	62–63	1964	64–65	1967	67–68	1968	68–69
City		12		15		10		21
East L.A.	5		3		11		3	
Harbor		11		14		6		2
Pierce		4		12		18		8
Southwest	---		---		---		---	
Trade Tech	61		66		69		69	
Valley		18		15		14		4
West L.A.	---		---		---		---	

NOTE: As indicated, some colleges keep records by calendar year, others by school year.
Southwest and West Los Angeles colleges opened in 1967 and 1968, respectively, with limited numbers of occupational curricula.

Employment market data by industry are given in Table 10. This information is accessible through the California Department of Employment, Research and Statistics Office, Los Angeles Metropolitan Area. Although raw figures in thousands show growth in all except agriculture and the construction industry, percentage figures vary less than 2% between 1963 and 1968. The greatest gross growth occurred in service industries. As discussed elsewhere in this report, information on specific occupations within industries is difficult to find, and in some cases is not available at all except for *preceding* years. Predictions of needs by occupational classification or job title are rare.

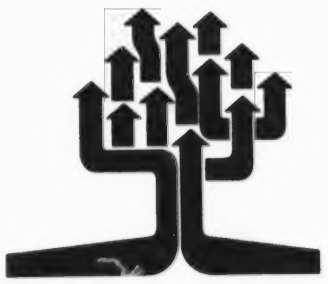


Table 10. Average Numbers Employed by Industry, for Target Years
Los Angeles-Long Beach Labor Market Area
(In Thousands)

	1963	% of Total	1965	% of Total	1968	% of Total
Agriculture, Forestry and Fisheries	21.2	.80	18.7	.67	15.4	.50
Mineral Extraction	10.4	.39	10.3	.37	11.6	.37
Contract Construction	146.6	5.51	139.4	5.00	123.5	3.98
Manufacturing: Durable Goods	549.5	20.64	548.0	19.66	640.0	20.61
Nondurable Goods	226.1	8.49	233.9	8.39	256.2	8.25
Transportation	84.4	3.17	87.7	3.15	103.7	3.34
Communications, Utilities	59.3	2.23	65.5	2.35	71.4	2.30
Wholesale Trade	169.2	6.36	177.1	6.35	195.4	6.29
Retail Trade	414.4	15.57	440.7	15.81	477.9	15.39
Finance	62.2	2.34	66.8	2.40	73.9	2.38
Insurance, Real Estate	89.2	3.35	97.3	3.49	101.2	3.26
Services	525.0	19.72	572.0	20.52	647.6	20.85
Government	304.2	11.43	330.0	11.84	387.5	12.48
Federal	55.9	18.38	57.5	17.42	69.4	17.91
State, Local	248.3	81.62	272.5	82.58	318.1	82.09
	2661.7	100.0	2787.4	100.0	3105.3	100.0

Reference: Page 46. (California Department of Industrial Relations)

STATUS, 1969 . . .

Reports from colleges, offices, and community are given under the headings of Curriculum Predictions, Instructional Needs, Occupational Guidance, Programs for the Handicapped and Disadvantaged, Funding of VEA Projects, Employment Market Forecasting. All except the last two came from the colleges. The District Office supplied funding data. Employment Market Forecasting summarizes results of a search of government documents and interviews with business, industrial, and employment personnel in the Los Angeles area over a two-month period. Every effort was made to discover useful, reliable, continuing surveys which would provide information to help curriculum planners, with small success. It took this long to be certain that the Colleges will need to initiate forecasts for their own use in curriculum planning.

Curriculum predictions from responding colleges for the next five years are given in the following tables in these categories:

To be phased out	Table 11
New	Table 12
Strong, with support needs	Table 13
Little change expected	Table 14
Major modifications expected	Table 15

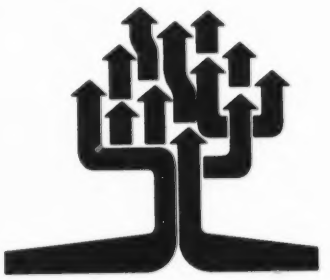


Table 11. Curricula to Be Phased Out in the Next Five Years

College:	East	Harbor	Pierce	Southwest	Trade-Tech	Valley
Respondent:						
Dean of Instruction	None	No response	Construction Inspection Technology Crop Production Dairy Science Poultry	None	Comptometry Machine Bookkeeping	Possibility: Computer Technology Physical Science Technology
Dean of Evening Division	No response	Auto and Diesel Engines (1970) Drafting (1970) Engine Fuel Technician Engineering Technician – Chemistry Liberal Arts – Technology Machine Shop (1970) Merchandising (1970) Office Machines (1970) Offset Lithography (1970) Printing (1970) Radio-TV Maintenance (1970) Secretarial Science (1970) Space Technology Surveying, Topographical Drawing	No response	None	Possibility: Comptometry Machine Bookkeeping Printing: Hand Composition Letter Press	Civil Engineering Fire Science (possibly) Engineering Geology Technology Physical Science Technology Industrial Technology: Manufacturing Operations

City, West L. A. – No response

Table 12. New Occupational Curricula Needed in the Next Five Years

College:	City	East	Harbor	Pierce	Southwest	Trade-Tech	Valley
Respondent:							
Faculty:	Computer Operation Dental Hygienist Electronic Servicing Inhalation Therapy Industrial Technology Licensed Vocational Nurse Licensed Vocational Orderly Medical Electronic Repair Nuclear Medicine Technology Physical Therapy Assistant Podiatry Assistant Small Business Management Vocational Rehabilitation Technician	Administrative Assistants for Health Facilities Auto Mechanic Building Trades Correctional Curriculum Cosmetology Dental Hygiene Assistant Electronic Technician Engineering Laboratory Technician Fire Science Food Services Management Homemaker Assistant Home Nursing Hospital Ward Clerk Hospital Ward Manager Hospital Ward Secretary Industrial Engineering Infusion Therapy Interior Decorating Manufacturing – Engineering Technician Medical Equipment Repair Microscope Technician Occupational Therapy Assistant Plant Engineering Plastics Processing Technician Printing Public Relations Retail Security Curriculum X-ray Technician Assistant	Aides for Hospitals, Rest Homes, Mental Hospitals and Schools for Exceptional Children Aircraft and Aerospace Design Engineering Technology Airline Stewardess Appliance Repair Auto Repair Building Inspector and Contractor Construction Supervision Data Processing Distributive Occupations Electrocardiograph Technician Engineering Aide in Civil Engineering Fashion Design Interior Design Home Nurse Technician Inhalation Therapy Legal Secretary Machine Design Engineering Technician Medical Office Assistant Metrology and Calibration Technology Numerical Control Electronic Technician Office Laboratory Technician Office Nursing Operation and Service of Computerized Equipment Orthopedic Technician Quality Assurance Technology Service Industries Surgical Technician Systems Engineering Technology Teacher Aide with Emphasis on on Instructional Material Development	Computer Electro-Mechanical Technology Computer Programming Computer Repair Construction Technology Consumer Products Repair and Maintenance Data Processing Dental and Medical Office Assistant Environmental Science Technician Executive Secretary Fluid Power and Fluidics Medical Electronics Instrumentation Medical Records Technician Medical Transcriber Medical Typist Oceanographic Instrumentation Office Assistant Ordnance Photography Plastics Printing Production Planning and Control Refrigeration and Air Conditioning Vocational Metallurgy	Broadcasting Recording and Composing of Commercial Music	No response	Administrative or Executive Secretary Construction Dental Hygienist Electro-Mechanical Equipment Repair Food Technology Inhalation Therapy Laboratory Technician Medical and Dental Assistant Medical Records Librarian Medical Secretary Technical Secretary Physical Therapist X-ray Technician

Dean of Instruction	No response	Auto Mechanics Cosmetology Medical Laboratory Technician Mental Health Technician	No response	Air Conditioning (1971) Data Processing (1971) Para-Medical Curricula (1971) (Licensed Vocational Nursing Program)	Computer Technology (1970) Metrology (1970)	Possibilities: Medical Assistant Mental Health Aide Occupational Therapy

Apparel
- Computer Pattern Grading (1973)

Applied Sciences
- Air Pollution Technician (1969)
- Computer Science Technician (1971)
- Fire Science (1970)
- Medical Technician (1969)
- Oceanographic Technician (1969)
- Police Science (1970)
- Waste and Sanitation Technician (1971)
- Water Treatment Technician (1972)

Art
- Silk Screen Process (1970)

Building Construction
- Technology
- Painting and Decorating (1969)
- Masonry (1969)
- Dry Wall Trades (1969)

Culinary Arts
- Hotel and Restaurant Administration (1970)

Drafting
- Engineering Technology (Design and Application) (1970-1971)
- Computerized Drafting (1972-1973)
- Micro-Filming Technician (1971-1972)

Expanded Work-Study Programs (1971-1972)

General Drafting for Other Trades (1970-1971)

Electrical
- Electrical Equipment Counterman-wholesalers (material processing (1970-1971)

Electronics
- Computer Maintenance Technician (1969-1970)
- Basic Electronics for Numerical Control in Print Shop and Vending Machines (1970-1971)

Metal Trades
- Closed Circuit Television
- Machine Shop – As soon as possible
- Vending Machines – As soon as possible

Plastics – As soon as possible

Precision Sheetmetal Layout – As soon as possible

Pre-Apprentice Heat Treating – As soon as possible

Psychiatric Technician (1969-1970)

Home Health Aide (1970-1971)

Physical Therapy Technician (1970-1971)

Nursery School Assistant (1970-1971)

Dean of Evening Division	No response	No response	None	No response	Oceanography	Aviation Pilot (1970) Electro-Mechanical System (1971) Mental Health Aide (1970) Metallurgy (1971)

Apparel
- Computer Pattern Grading (1973)

Apprenticeship
- Industrial Maintenance Mechanic (1971)
- High Rise Buildings – Modular Construction (1971)

Auto Body and Fender Shop
- Management and Frame Alignment (1970)

Art
- Development of Video-Tape Instructional Materials (1970)
- Journalism Photography (1972)

Electronic Technology
- Customer Engineering for Computer Maintenance Repair (1970)

Health Occupations
- Central Services Technical (1969)
- Home Health Aide
- Nursing Home Assistant

NOTE: No response from West L.A.; opened September 1968.

Table 13. Support Needs: Strong Occupational Curricula 1969–75

(Responses from Deans of Instruction and Deans of Evening Divisions)

	Equipment	Instructional Materials	Space	Personnel	Other
City:					
Not available[1]					
East L.A.:					
Business Data Processing	X				
Inhalation Therapy	X		X	X	
Medical Record Science	X		X	X	
Police Science		X	X	X	
Harbor:					
Air Conditioning & Refrigeration	X			X	
Engineering Technology					
Electromechanical	X		X		
Electronics	X		X		
Engine Technology	X		X		
Instrumentation	X		X		
Pierce:					
Automotive	X			X	
Floral Design	X		X	X	
Numerical Control	X				
Secretarial Science	X			X	
Television	X			X	
Welding	X			X	
Southwest:					
Data Processing	X		X		
Drafting Engineering	X		X		
General Technology	X		X		
Metrology	X		X		
Nursing	X		X		
Nursery School Education	X		X		
Prosthetics	X		X		
Secretarial	X		X		
Trade Tech:					
Aircraft Mechanics	X	X	X	X	
Apprentice Training	X	X	X	X	
Business Data Processing	X	X		X	
Chemical Technology			X		
Commercial Art & Photography	X		X	X	
Cosmetology					Transportation for clients
Culinary Arts					Cafeteria alteration
Electronics Technology	X	X	X	X	
Fashion Design	X	X		X	
Inspection Technology (Bldg.)			X		
Motorcycle Repair	X	X			
Secretarial Science	X	X		X	
Valley:					
Business Data Processing				X	
Commercial Art	X		X		
Journalism				X	
Merchandising				X	
Nursery School Education	X		X		
Nursing			X		
Police Science				X	
Theater Arts	X	X		X	
Photography			X		
Drafting	X				
Motion Pictures		X		X	
West L.A.:					
No response[2]					

[1] Development of local Master Plan in progress.

[2] Non-participant in survey. Opened Fall 1968.

Table 14. Curricula Expected to Continue with Little Change for the Next Five Years

College:	City	East	Harbor*	Pierce	Southwest	Trade-Tech	Valley
Deans of Instruction and Evening Divisions	None	Advertising & Graphic Arts Architecture Nursing Photography Secretarial Science	Accounting Air Conditioning/Refrigeration Architectural Tech. Business Administration Drafting, Mech. or Engrg. Engine Technology Engineering Tech – Electronics Engineering Tech – Tool Engrg. Fashion Design Merchandising Fire Science Home Economics Home Furnishing Merchandising Industrial Supervision Instrumentation – 1 Year Liberal Arts Liberal Arts – Business Liberal Arts – Science Mech. Tool Tech. (Tool & Die) Mfg. Tech. (Tool Design) Nursery School Education Nursing, Professional Office Machines, Clerical Procedures Police Science Printing Tech. Real Estate Secretarial Science Art, Commercial	Advertising Art Agricultural Science Agriculture Business – Horticulture Animal Science Crop Production – Field Fruit Dairy Science General Agriculture Horticulture – Floral Design and Management Horticulture, Landscape Laboratory Animal Technician Automotive Service Technology Business – Escrow Business – General Business – Supervisory Management Construction Inspection Technology Drafting – Architectural Drafting – Design Electronics Engineering Technology Engineering Technician, General Industrial Technology Machine Tools Technology Music Numerical Control Electronic Maintenance Technician Quality Control Engineering Recreation Secretarial Science Clerical, General Secretarial (Legal, Medical, Technical) Technical Illustration (Commercial, Industrial) Television Service Technician Theatre Arts Tool Engineering Welding Technology	General Technology Nursing Prosthetics	Aircraft Applied Science (Chemical Technician) Apparel Trades Dry Cleaning Fashion Design Power Sewing Art Trades Commercial Art Merchandising Photography Sign Painting Technical Illustration Auto Department Auto Body and Fender Auto Mechanics Auto Servicing Heavy Truck and Equipment Repair Motorcycle Repair Building Technology Business Education Cosmetology Culinary Arts Drafting Electrical Construction and Maintenance PBX Wireman Electronics Metal Trades Printing Bindery Graphic Arts Letterpress Management Vocational Nursing Health Occupations Core Nursing Home Assistant Vocational Nursing	Accounting Art, Commercial Broadcasting Business Data Processing Business Management General Option Finance Management Option Purchasing Management Option Electronics Technology: General Bio-Medical Option Engineering Technology Electronic Design Drawing General Option Tool Design Fire Science Flight Line Mechanics Apprentice Home Economics Journalism General Option Photo-Journalism Option Machine Tool Technology Apprentice Merchandising Music Nursery School Education Nursing LVN Nursing RN Office Machines – General Clerical Police Science Real Estate Secretarial Science Supervision – Management Theater Arts General Option Motion Picture Option

NOTE: No response from West L.A.; opened September 1968.

*Response by Dean of Evening Division only.

Table 15. Curricula Requiring Major Modifications in the Next Five Years and Year of Greatest Need for Financial Support

College:	City	East	Harbor	Pierce	Southwest	Trade-Tech	Valley
Respondent:							
Dean of Instruction	No response	Data Processing (1971) Inhalation Therapy (1970) Medical Record Science (1970) Police Science (1970)	No response	Business Data Processing (1970) Numerical Control Control Programing (1974) Welding (1972)	No response	Aerospace Systems Technician (1970) Aircraft Design and Drafting (1971) Aircraft Management (1970) Aircraft Welding Specialties (1970) Airline Transportation (1971) Aviation Mechanic Management and Administration (1971) Aviation Specialties (1970) Exploratory Aviation Trades (1970) Flight School (Ground/Air) (1970) Rotary Wing Technician (1970) Stewardess (1970) Supervision-Aviation Specialties (1970) Apparel-Dry Cleaning (1970) Fashion Design (1970) Power Sewing (1970) Building Technology Air Conditioning Technology (1969–70) Refrigeration and Air Conditioning (1969–70) Business Education Business Data Processing (1970–71–72) Secretarial Science (1969–70) Culinary Arts Commercial Cooking (1969–70) Restaurant Management (1969–70) Drafting Computerization (1972–73) Micro-Filming (1969–70) Paste-up (1971–72) Electronics Electronics Engineering Techniques (1969–70) Electronics Technology (1971–72) Radio and Television (1970–71) Metal Trades Machine Shop (1969) Metallurgy (1969–70) Plastics (1970) Welding (1969)	Merchandising Nursery School Education (1970)
Dean of Evening Division	No response	No response	Engineering Technology Air Conditioning (1969) Electro-Mechanical (1969) Electronics (1969) Engine Technology (1969)	No response	Business Administration Nursing (1972) Secretarial (1972)	Apprenticeship Training Doubling of Welding Classes (1970) Expansion: Apprentice Theory Classes Metal Technology (1971) Thermodynamics in Refrigation (1971) Testing of machine optics – Large gauges and small optic comparatory (1971) Printing: New equipment: Enlarger Scanner (1970) Photo Offset – Color Separation (1971) Linotype (1970) Offset Press equipment (1970)	Business Data Process Processing (1969) Commercial Art (1969) Drafting (1972) Journalism (1969) Merchandising (1971) Motion Pictures (1969) Nursery School Education (1970) Nursing (1969) Police Science (1969)

NOTE: No response from West L.A.; opened September 1968.

Instructional Program needs and students' suggestions for new courses are given in the following pages:

Priorities for change	Table 16
Updating instructional skills	Table 17
Updating equipment	Table 18
Suggested additional courses	Table 19

Table 16 summarizes responses by faculty members who listed in order the five highest priorities for change in the occupational education programs in their respective colleges. The questions required constructed responses. Facilities, equipment, and curriculum were mentioned the most times, with personnel, public relations, and work-study programs also listed by a number of respondents.

Table 17 summarizes responses by Deans of Instruction and of Evening Divisions to the question, *Do you have any tenured personnel who are qualified to teach only in fields which are now or are becoming obsolete?* The responses report three such persons in the District. Deans of four colleges approve of subsidized programs of retraining for such personnel; one felt that personnel in occupational education would be demoralized by being singled out for retraining. Suggestions for retraining programs include sabbatical leaves, two-week seminars in cooperation with industry, and use of consultants.

Table 18 is a list of new and replacement equipment suggested by faculty members on all campuses in their respective teaching fields.

Table 19 shows students' suggestions for added courses in occupational education. Student questionnaires were not returned from three campuses.

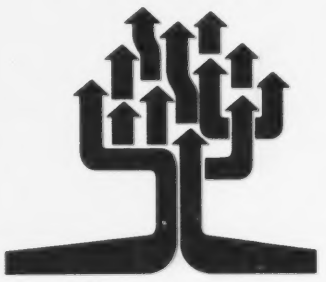


Table 16. Priorities for Change Listed by Faculty

	1st	2nd	3rd to 5th
Curriculum	20	17	31
Equipment	16	25	26
Facilities	28	10	34
Personnel	17	11	13
Public Relations*	3	3	11
Work-Study Programs**	6	2	11

*Requests for public relations included suggestions for better articulation between high schools and community colleges, publicizing occupational programs in the community, and more contacts with industry.

**A program of curriculum related work experience for students during the training period at college is recommended strongly by a number of faculty respondents.

Table 17. Number of Tenured Faculty Qualified to Teach Only in Fields Which Are Now or Are Becoming Obsolete

Responses by:	Dean of Instruction	Dean of Evening Division
City	No response	No response
East	None	No response
Harbor	No response	None
Pierce	1—Crop Production 1—Dairy Science	No response
Southwest	None	None
Trade Tech	1—Metallurgy	None
Valley	None	None

Table 18. Added or Replacement Equipment Needed to Keep Instructional Programs Current (Faculty Responses – All Colleges)

Agriculture:

Mechanical equipment, including farm tractors.

Multipurpose laboratory for soils, small animal, dairy, feed analysis, animal nutrition, etc.

Automatic sprinklers operated on a time clock with the latest tensiometers.

Greenhouse – all automatic and temperature and humidity control.

Architecture:

Computer available.

Surveying equipment.

Model making facilities.

File of manufacturers' literature.

New drafting tables with parallels in place of "T" squares, and linoleum tops in place of formica.

More drafting machines.

More in drafting area.

Lettering typewriters, computers, microfilm and microfiche reproduction material.

Lighting in all drafting rooms to industry standard.

Art:

Underwater photographic gear.

Automotive and Engine:

Alignment equipment.

Oscilloscopes.

Brake analyzers.

Steam cleaner.

New automotive components, such as automatic transmissions, alternators, distributors, carburetors . . .

New diagnostic equipment for ignition, carburetion, brakes, and alignment . . .

Special tools, books and manuals for current automatic transmissions and engines.

Alignment and wheel balance equipment.

Special tools for front suspension work.

Training aids in diagnostic equipment from different manufacturers.

Business:

Either a third generation computer or adequate terminal connected to one.

PBX switchboard.

Video tape equipment for sales classes, human relations classes

New electronic calculators.

Electric typewriters, IBM Selectrics, and IBM Executives.

Transcribing machines.

Greater capacity computer.

Composer (such as MTST).

Selectric typewriters for key punch simulation as well as regular instruction.

A complete educational-instructional computer system for teaching: 24 key punches, a complete unit record equipment, a small-medium size computer, disk equipment, tape equipment, off-line terminals (6).

Updated data processing equipment.

Updated office machines and equipment.

Lockers for students.

Twenty electronic printing and display calculators.

Overhead projectors.

Movie projector.

Fluid duplicator.

Mimeograph.

Visual aids, such as adequate anatomical slides (for medical secretary).

Intercom telephones.

Teletypewriter instructional equipment.

Switchboard instructional equipment.

All types of copying machines.

L-shaped desks.

Dictaphone dictation-transcription unit.

Wireless multi-channel dictation unit.

Communication:

Photo equipment, cameras, enlargers, etc., and added darkroom.

New types of type and offset equipment in print shop.

Photo lathe or other machinery for making engravings.

Color photography and processing.

Black and white photo laboratory.

Computer:

Electronic Servicing Shops.

Drafting:

Calculators – assorted types.

Metrology and calibration equipment.

Blueprint machine.

Numerically controlled drafting machine.

Eight level tape punches.

Access to IBM 360-50 or equivalent computer.

Microfilm camera set-up.

Audio-tutorial equipment, materials.

Thermofax machine.

Book copier.

Bench size milling machine.

Small lathes.

Power tools.

Injection molder.

Gas melting and heat treat furnaces.

Electrical and Electronics:

Instrumentation laboratories involving complete engineering systems and processes relevant to the surrounding employment area.

Computer trainers and test equipment.

Test equipment for integrated circuit analysis.

Current model consumer products (radio, TV).

Modern curve tracing scopes.

Video recording devices to prepare for the large consumer maintenance requirements in 1970.

Oscillographs.
Chart recorders.
Electronic counters.
High frequency oscillators and rocket engines.

Engineering:

Numerically controlled drafting machine.
Eight level tape punches.
Access to IBM 360-50 — or equivalent computer.
Calculators (assorted).
Microfilm printer and camera.
AV multi-media teaching aids.

Home Economics:

Model nursery school laboratory and classrooms.
Nursery education center.
Dress forms.
Other small dressmaking equipment.
Specialized clothing construction lab.
More rooms for clothing classes.
More rooms for foods classes and equipment classes.
Additional sewing machines.
Fitting room facilities.
Locker facilities.
Fully equipped kitchen units including electronic ranges.
Grading and cutting tables.

Medical-Dental:

Laboratories with audio visual equipment for programmed and other self- directed study.
More laboratory space for clinical practice.
More office space.
Additional X-ray units.
More radiographic material in our Radiologic Technology Program.
X-ray control stands.
Geiger-Muller tube.
Angle camera
Taping system to record dynamic happenings on the camera.
New scanner, Picker Magnascanner, or Ohio, Nuclear.
New scaler and probe.
Graph records to attach to the taping system for renograms.
TV monitor and screen to focus on one particular instrument
Polaroid camera attachment to go with tape, camera and graph.
Cassettes (filmholders).
A hospital type cart.
A nursing type dummy patient.
The equipment needed for the proposed transcription laboratory and directed practice laboratory (simulated hospital medical record department).
Files, both shelf and drawer.
Laboratory materials, including sample medical records.
Hospital beds.
Colostomy irrigating sets, drainage tubing and bags, measuring devices, simulated medical bottles, medicines and new type syringes.
All electrical and disposable equipment should be reviewed yearly and replaced with newer equipment in use in the clinical facilities.
Programmed units in basic nursing procedures.
New hospital beds.
Need expanded flow of current nursing literature in both book and magazine form.
Record player.
New 8mm and 16mm movie projectors and films.
Additional anatomical posters and posters of abnormalities.
Plastic models of food sizes in calculating diabetic diet and some posters or exchange lists.
Film strips and auto tutor programs.
Electrocardiograph tutor and machine.
Intermittent positive pressure machine.
Fetal monitors, etc.
IPPB machine, suction apparatus, Foster Frame.
Cardioscope with tape.

Printing:

Lithographic equipment and teletype setting.

Public Administration:

Crime laboratory equipment.
Full-time aide for audio visual.

Theater Arts:

Lighting equipment.
Lighting sources and uses.
Training in uses of electronic control and memory systems.
Sound equipment control system.

Technology (miscellaneous):

Abrader.
Reflectometer.
20- and 60-degree glass meter.
Dip coater.
Roll Mill.
Brookfield.
Distillation unit.
Needle plasma and plasma for cutting steel, copper, aluminum, etc.
Vacuum casting equipment, shell mold casting equipment, small parts storage.
150 angle iron notches, ring and circle shears, projector/recorder combinations.
2-NC "Flexwriters"; QC equipment; fluid paver components; general tooling for machine shop and NC (cutters, reamers, etc.).
Production equipment (turret lathe, screw machine, tool and die).

Future changes in the operation of various occupations will demand that the program begin its own changing to meet the standards of tomorrow. –Student.

I would add a class which would enable students to go out into the community a couple of hours a week and actually work in a legitimate office rather than a classroom at the college. – Student.

Stress more exactly just what industry expects from an employee . . . be in close contact with industry and therefore be able to relate to the student exactly what's going on. – Student.

Table 19. Additional Courses Suggested by Students.

East L.A.:

Advanced Color Photography (4)
Architectural Design and Urban Planning (more)
Automation
Black Studies
Cinema Photography (7)
Communication Skills (More)
Creative Photography (2)
Department Store Management
Key Punch (2)
MTST (3)
Remedial Courses in Basic Skills
Technical Typing
Transcribing Machines
TV Photography
Underwater Photography

Harbor:

Business Courses in Technology, Industry, Medicine, and Law
Business Machines
Court Stenography (2)
Engineering
Legal Secretarial Science (2)
Office Courtesy
Photography
Speedwriting
Stenotype (3)
Transcribing Machines (3)

Pierce:

Bookkeeping
First Aid
Home Economics (2)
Photography
Shorthand Review III
Space Technology (2)

Trade-Technical:

Speech Therapy
Stronger academic program

Valley:

Aeronautic and Diesel Mechanics
Advanced Law (2)
Auto Mechanics
Basic Reading and Study Skills
Black and/or Mexican-American Studies (4)
Computer Operation
Dental Technology
Education
Electronic Drafting (more)
Floriculture (2)
Forestry
Home Economics
Interior Decorating
Marine Biology
Music Appreciation for Modern Music
Oceanography
Programming
Speedreading

City, Southwest, West L.A.

No response

Occupational Guidance is not a central function of a counselor in the Los Angeles Colleges. This is shown by counselors' responses to questions concerning current practices and by their suggestions for change. A number said that a change in the occupational guidance program would require the *addition* of an occupational counselor to the staff. Current guidance practices mentioned most often were testing, test interpretation, and referrals to an occupational library, the Advisement Service, the Veterans Administration, or the Department of Employment.

Counselors' reports of the percentage of students seeking help in determining an occupational objective range from zero to 80%, with half reporting 10 to 30%. Interest of students in occupational programs requiring two years or less of college is reported as increasing by 20 counselors, decreasing by 18, and unchanging by 12.

Programs for disadvantaged* and handicapped* students in the Los Angeles Community Colleges include:

Financial Aids:
- Scholarships
- Loans
- Work-Study Programs
- Assistance in Finding Employment

Study Aids:
- Academic Counseling
- Tutorial Assistance
- Special Training Programs
- Orientation Programs
- Community Special Services

Services for physically handicapped students include counseling as related to health conditions, special arrangements such as parking permits, health examinations, and referrals.

Services for psychologically handicapped persons are consultations and referrals by counseling and health services staffs.

*Definition—Page—45

Not all colleges report all these services.

One college reports a Black Reading Center and a study assistance program housed in the Student Lounge as a joint effort of the Student Government and the Reading Clinic. Another college reports Manpower Development Training Act and Work Incentive (WIN), programs to train and retrain for employment. For the educationally disadvantaged, the same college reports special one-year curricula to train assistants at beginning levels of employment in thirteen occupations:

- Aircraft Production Skills
- Art Production Assistant
- Assistant Cook
- Automotive Servicing
- Building Construction Techniques
- Clothing Manufacturing Assistant
- Cosmetology Salon Assistant
- Drafting Office Assistant
- Electrical Supplies and Equipment Processing
- Electronics Assistant
- Mechanical Assistant
- Nursing Home Assistant
- Printing Job Shop Assistant

Also listed are joint programs with the Bureau of Indian Affairs, the Job Corps (to train underprivileged students), and the Department of Veteran Affairs (to train disabled veterans). Cooperation with the Department of Vocational Rehabilitation in retraining handicapped persons also is reported.

Except for Federally funded programs for special categories of students, the apparent prevailing policy is expressed by one dean, who states that specific and special programs are available to all students, but that some are especially useful to handicapped or disadvantaged students.

Employment market forecasting resources in Southern California have been canvassed. These include the U.S. Department of Labor, California State Department of Employment, Los Angeles Chamber of Commerce, Southern California Council for Industry-Education, Merchants and Manufacturers Association, AFL–CIO, Bank of America, Security-Pacific National Bank, General Telephone, and the Los Angeles City Department of Water and Power.

Systematic long-range employment projections are not being done, and the labor market information that is available is classified by industry, not by occupation. Inquiry within an industry is necessary to identify which occupations are affected by marked increase or decrease of people employed. Such inquiry in the form of an area skill survey can be conducted by school personnel in cooperation with the California Department of Employment. In the latter agency, the Occupational Analysis division, on request, conducts surveys for the Los Angeles Metropolitan Area through the Industrial, Service, Commercial, and Professional offices. In addition, each branch office employs an occupational analyst to conduct local surveys.

*Labor Market Research Methods** published by the Department of Labor recommends that area skills surveys be directed to occupations requiring a training period of a year or more. It lists basic information to be obtained directly from employers:

1. Total number employed.
2. Total employment needs.
3. Scheduled hours of work per week for the majority of workers.
4. For each occupation selected for the survey:
   a. total current employment
   b. trainees currently on organized programs
   c. job vacancies for which workers currently are being recruited
   d. number of additional workers needed
   e. number of workers expected to complete training programs
5. Wage data may be collected for all occupations or for selected occupations.
6. The following information may be useful:
   a. plant expansion projects during the next 5 years
   b. expected shifts in industrial activity over the same period
   c. specific managerial, engineering, scientific, or technical occupations in which a higher or lower proportion of workers will be needed
   d. occupations with shortage of qualified workers during the past year and causes of shortage
   e. planned expansion of in-plant training program
   f. suggestions or recommendations for needed occupational training programs.

A potentially useful labor market forecasting method is modeled from (1) an industry-occupation matrix, (2) industry-production functions, (3) production and time relationships, and (4) integration of data and functions. This method is described by its orginators in a document published in March 1966 by the Bureau of Economic Research, Institute of Behavioral Science, University of Colorado.* The report includes descriptions of labor market forecasting methods and their uses.

Early in 1969 the Research and Statistics division of the California Department of Employment released *California Manpower Needs to 1975*, a report using the Colorado model. This report is available to school personnel. The report, however, is based on occupational data from the 1960 census, includes no new occupations since then, and data are not broken down for local areas. A working paper which explains local use of the Colorado model also is available at the Los Angeles office of the Department of Labor.

Although a workable method for labor market forecasting appears to be developing, currently there is no systematic reliable method in use in Los Angeles County. Some special skills surveys have been conducted for Los Angeles Trade-Technical College and used as a basis for beginning, revising, or deleting certain occupational curricula.

Systematic area skills surveys for the Los Angeles Community Colleges are needed to assist in curriculum planning based on employers' needs for qualified graduates. A brief and random survey indicates that industries themselves do not forecast employment needs as a continual or systematic practice. It is recommended that the Colleges develop cooperative programs with local employers to provide such forecasts for curriculum planning. Continuing evaluation and follow-up also are needed to validate surveys and for early detection of trend changes.

*Reference–Page–47

*Reference–Page–46

Funding of VEA projects, 1968–69, is shown in Figure 4; information for 1964–65 under VEA 1963 and for other federal funding for projects in 1962–63 could not be located. From the one-year sampling, it appears that two of the older colleges and one new one, all serving large numbers of minority group populations, are not participating in this source of financial assistance to occupational education.

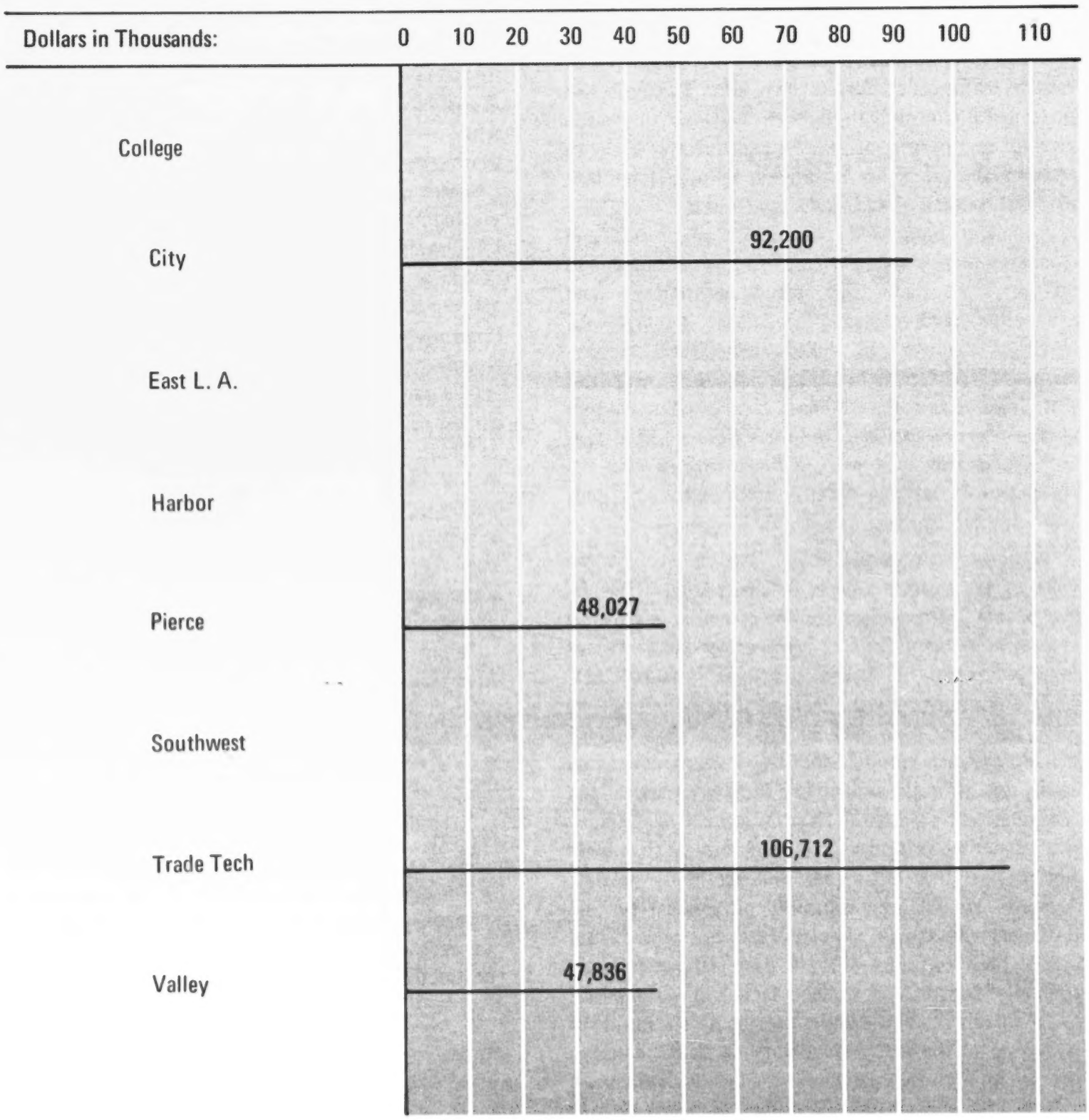


Figure 4. VEA Funded Projects in District – 1968–69.

4. ON BEYOND: EVOLVING SOCIETY

Observers of social change predict that computers and associated technology will transform American life in the next 30 years. Among expected transitions is the movement from the work ethic to a leisure ethic; from manufacturing supervision by men to monitoring and self correction by machines; from materialism to personalism – satisfaction in variety and excellence of human performance for its own sake. Machines will perform technological routines, freeing men to provide personal and professional services which require affective response and the higher cognitive functions. It will be a world of technology and tender loving care.

Computer controlled communications media and manufacturing equipment are serving business and industry, providing high speed transmission and production, and changing manpower requirements. Much of the work of skilled workers and paraprofessionals is performed by man-machine teams faster and with fewer errors than humans can do. A typewriter types endless perfect original letters from a master tape, but people still must prepare the tape and keep the equipment in working order – both higher level jobs than copy typing.

With escalating availability, computers will do the work of and perform services for many kinds of people. For people in the professions, the computer is an active aide: it monitors patients; it searches for and prints out legal precedents; it designs structures from specifications; and can extrapolate the present to the future – all with less error rate and in less time than human paraprofessionals require. Students will learn more by an earlier age through simulation, learning programs, and computational support. Mature workers will be retrained with computer assistance. Scientists, through simulation and mathematical techniques, will accelerate research. Agriculturists will gain capability for weather control. Engineers will design, simulate, and test new devices before they are built. Military men will have greater control of logistics and strategic factors in war or peace.

All of this has dual significance for Americans in the latter half of the twentieth century. It means increased production with less manpower at some levels and more at others, and a greater proportion of leisure-time to work-time for all who desire it. Manpower is likely to be concentrated in lower and higher level occupations: mid-level manufacturing processes, for example, will be managed by programmed computers and automated response systems. Personnel displaced by automated systems will require retraining into new occupations immediately, and by the end of the century may join a predicted class of consumer-students living [illegible] guaranteed annual income.

Human excellence and versatility well may become status symbols of the middle class in a leisurely, non-competitive society. The responsibility of education in such a society is to provide life-long learning, to [illegible] ready with environments for learning new skills and developing high competence in established ones.

There is a period ahead, then, in which education will provide learning environments both for employment and for leisure. This will be a time of transition between the industrial and the post-industrial society, when some Americans will be entering one and some the other. Impoverished people will be moving toward a life already familiar to middle class society; the latter then will be moving into the post-industrial leisure class which will capitalize on the capabilities of machines.

Middle class employed persons will enjoy more leisure in the years ahead than have their predecessors. In addition, their employment will require higher technical training and higher skill levels in the service occupations, and they must prepare for change – a single occupational skill is unlikely to bring rewards over the working life of most people.

Junior colleges in the years ahead will be fulfilling three major functions:

- Occupational preparation for employment.
- Lower division preparation for four-year colleges.
- Occupational preparation for leisure.

To accomplish the most for people most in need and in the quickest time, preparation for employment is emphasized here, with a hope that educators will keep one eye on the future need for education for constructive use of leisure time.

5. REPRISE

In the foregoing pages applications of system science concepts are described. A plan has been presented, and this plan includes formulation of a system for occupational education in the Los Angeles City Community Colleges. Principal aspects of the plan and the proposed system are:

	PLAN	SYSTEM
PURPOSE	To introduce a system of occupational education composed of interdependent subsystems which provide services to students and college staffs to enable them to achieve the system objectives.	To provide resources and environments in which students will learn content and processes which will enable them to engage in lifelong constructive and rewarding occupations.
OBJECTIVES	To provide information, ideas, recommendations and models upon which coordinated programs of occupational education both within colleges and throughout the District can be based.	To provide: Facilities and environments in which students will learn initial occupations, and will progress through occupational hierarchies and keep up in occupations which change. Needed qualified employees to local employers. Resources and environments which will enable students to make occupational decisions and to learn the decision-making process. Guidance, instructional, placement, and auxiliary services which will be especially useful to handicapped persons. Remedial and compensatory programs in which students will learn skills they lack which are corequisite to effective learning in the college occupational education program. Resources with which students and graduates will find employment in their respective fields of occupational education and will learn procedures for job finding, selection, and application. Introduction of occupational education as a component of a projected leisure oriented society.
CONTENT	Information, ideas, and models for curriculum planning, instruction, guidance, placement, continuing education for staffs, evaluation, and funding and budgeting; information on present status of occupational education in the Colleges.	Functioning interdependent subsystems for curriculum planning, instruction, guidance, placement, continuing education for staffs, evaluation-revision, and funding and budgeting; coordinated programs among the Colleges.
PROCEDURES	Compilation of this report.	Staff training Organization analyses Review of staff functions Design of system and subsystems Installation Evaluation Revision

7. THE ASTERISKS: DEFINITIONS

The terms listed below are defined as used in this paper.

Cooperative program. An arrangement between college and an employer to provide meaningful work experience coordinated with on-campus study. VEA 1968 states, "Such programs remove artificial barriers which separate work and education and, by involving educators with employers, create interaction whereby the needs and problems of both are made known. Such interaction makes it possible for occupational curricula to be revised to reflect current needs in various occupations." (Sec. 171). VEA 1968 authorizes financial assistance to such programs. (See also Work Study.)

Disadvantaged. Describes students who are not adequately prepared for making normal progress in an established program or setting for reasons other than physical handicap. Specifically included in VEA 1968 are individuals, "who have academic, socioeconomic, or other handicaps that prevent them from succeeding in the regular vocational education program." [Part B. Sec. 122(4)(A)] A minimum of 15% of any state's allotment under the Act must be applied to the education of the disadvantaged except under special conditions.

En route. In educational systems this describes tasks or behavior of learners at any point between measurement of entry behavior and behavior after completion of the learning program.

Handicapped. Persons who are mentally retarded, hard of hearing, speech impaired, visually handicapped, seriously emotionally disturbed, crippled, or otherwise health impaired who therefore require special education and related services. [VEA 1968, Sec. 108(6)]. At least 10% of any State's allotment under the Act must be applied to vocational education for handicapped persons.

Occupational education. Interrelated instructional programs and services designed to develop competence which the learner expects to exercise either in immediate employment or as alternative employment at a later time. In the longer view, the definition is extended to include competence developed to an employment level but exercised in leisure activities.

Simulation. Environments and activities designed to approximate real situations for the purpose of testing or teaching. It provides for a learner an opportunity to perform in circumstances similar to reality without the risk, is replicable for successive experimentation and practice under the same circumstances, and provides feedback on level of performance.

System. A functioning organization of interrelated and interacting components purposefully designed to achieve specific, formulated objectives. In occupational education the components are the instructional programs and related services which lead students to successful education-related employment or, in the future, to constructive use of leisure time as that becomes a more significant factor in American life.

Vocational Education. Under the Vocational Education Act of 1968 the term means vocational or technical training or retraining designed to prepare individuals for gainful employment, excluding those which require a baccalaureate or higher degree. It includes guidance, placement, training of teachers for vocational education or to meet the special education needs of handicapped students, and the acquisition, maintenance, and repair of instructional supplies, teaching aids, and equipment. It does not include acquisition, construction, or initial equipment of buildings or acquisition or rental of land.

Vocational education is used in this paper only in the context of historical use of the term or its use in VEA 1968. **Occupational** education is used as a broader concept more appropriate for contemporary and future development.

Work sabbatical. A leave of absence for professional personnel to be employed in work related to college assignment without financial loss. VEA 1968 provides for training and development programs for vocational education personnel *who have occupational competencies ... through exchanges of personnel between vocational education programs and commercial, industrial, or other public or private employment related to the subject matter ... and to provide programs of in-service teacher education and short-term institutes for vocational education personnel*. (Part F. Sec. 551).

Work study. Employment of students in study-related work concurrently with on-campus instruction. VEA 1968 provides financial assistance to work study programs for personnel to coordinate them, instruction related to the work experience, to reimburse employers for added costs of providing on-the-job training, and for services such as transportation and other unusual expenses to students. (Part G. Sec. 171).

8. For more: reading list

References in this list are selected for their contribution to the preparation of this report and to personnel involved in developing a System for Occupational Education.

Banathy, B. H. *Instructional Systems*. Palo Alto: Fearon Publishers, 1968.

A brief, clear exposition of characteristics and methods of instructional system design. Widely used as a text for training school personnel.

Beck, I. and Monroe, B. *Some Dimensions of Simulation*. Seal Beach, California; Insgroup, Inc. 1969.

Dimensions of simulated environments for instructional purposes are discussed.

Burt, S. M. *Industry and Vocational-Technical Education*. New York: McGraw-Hill, Inc., 1967.

A comprehensive report on industry-education cooperative activities in the nation.

California Department of Employment, Los Angeles Metropolitan Area. *Economic Background of Los Angeles County*. Los Angeles: California Department of Employment, April 1967.

Past, current, and anticipated population and labor force trends for seven areas identified as poverty pockets.

California Department of Employment, Research and Statistics, Los Angeles Metropolitan Area. *Recent Labor Market Trends in Los Angeles County*. Los Angeles: Department of Employment, 1968.

Report of labor trends in Los Angeles County for 1967.

California Department of Industrial Relations. *Estimated Number of Wage and Salary Workers in Nonagricultural Establishments by Industry, Los Angeles-Long Beach Metropolitan Area, 1949–1968*. San Francisco: California Department of Industrial Relations, January, 1969.

A report of numbers employed by industry for years 1949–1968. Used by State Department of Employment for labor market analyses.

California Institute of Technology. *The Next Ninety Years*. Pasadena, 1967.

Symposium on issues of population, food, water, chemical and thermal pollution, and cities of the future.

Cousins, N. Art, Adrenalin, and the Enjoyment of Living. *Saturday Review*. April 10, 1968.

Science, education, and the arts related to the leisure society.

Department of Health, Education and Welfare, U. S. Office of Education, Department of Health, Education and Welfare, U. S. Office of Education, Office of Programs for the Handicapped. *Vocational Training, Employment: Part Two – Profiles of the States.* Washington, D.C.: January, 1969.

A profile focusing on problems of unemployment in the context of migration, the labor force, and Federally funded skills training programs.

Fantini, M. and Weinstein, G. *The Disadvantaged*. New York: Harper and Row, 1968.

Takes position that current methods of education are inadequate for all students. Particularly related to this report: Ch. 5, From Purpose to Product.

Fishman, L., Roberts, W. E., Franks, C. M., and McCormick, W. W. *Methodology for Projection of Occupational Trends in the Denver Standard Metropolitan Statistical Area*. Boulder, Colorado: Bureau of Economic Research, Institute of Behavioral Science, University of Colorado, March, 1966.

Includes comprehensive survey of employment forecast practices and proposes a method of forecasting regional employment by occupation.

Hirsch, W. *Inventing Education for the Future*. San Francisco: Chandler Publishing Co., 1967.

Collection of papers on the future and educational change.

Kahn, H. and Weiner, A. *The Year 2000*. New York: Macmillan Co., 1967.

Discussion of the post-industrial society and extrapolation of present change trends into the future.

Mager, R. F. and Beach, K. M., Jr. *Developing Vocational Instruction*. Palo Alto: Fearon Publishers, 1967.

Step-by-step instruction with examples in systematic design of vocational education.

Maley, D. *An investigation and development of the cluster concept as a program in vocational education at the secondary school level*. OE 685-023, University of Maryland, August 31, 1966, ERIC No. ED 010 301.

Describes cluster concept as way of preparing people for several related occupations instead of one specialization.

_____, *Construction cluster – An investigation of the cluster concept as a program in vocational education at the secondary school level*. OE 685-023, University of Maryland, August 31, 1966. ERIC No. ED 010 302.

Task analysis and course outline in construction cluster.

_____, *Electromechanical installation and repair cluster – An investigation and development of the cluster concept as a program in vocational education at the secondary level*. OE 685-023, University of Maryland, August 31, 1966, ERIC No. ED 010 303.

Task analysis and course outline in electromechanical installation and repair cluster.

_____, *Metal forming and fabrication cluster – An investigation and development of the cluster concept as a program in vocational education at the secondary level*. OE 685-023, University of Maryland, August 31, 1966, ERIC No. ED 010 304.

Task analysis and course outline in Metal Forming and Fabrication.

Ninetieth Congress. *Public Law 90-576, 90th Congress, H.R. 18366*. Washington, D.C., October 16, 1968.

Official printing of Vocational Education Act of 1968.

Sackman, H. *Computers, System Science, and Evolving Society*. New York: John Wiley and Sons, 1967.

A literate and stimulating description of applications of computers and system science, projections of things to come, and issues in changing society.

State of California. *The Vocational Education Act of 1968, Public Law 90-576: A Resume*. Sacramento: State of California, 1968.

A summary of the Vocational Education Act of 1968 with definitions and authorized uses and level of Federal funding.

Stout State University. *American Industry Project*. Contract OE 5-85-060. Developmental and Pilot Proposal, 1965.

Proposes development of teaching materials on American industry as transitional material between general and vocational education at the secondary level.

United States Department of Labor, Bureau of Employment Security. *Labor Market Research Methods*. Washington, D.C., U. S. Government Printing Office, 1957.

Labor market research methods in use up to year of report.

University City Science Center. *Career Development*. Philadelphia, Pa.: 1967.

Presents survey findings on status of occupational education in Philadelphia and makes recommendations for reorganization. Emphasizes practice in making decisions throughout the school years, and preparation for change.

9.who did it...

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